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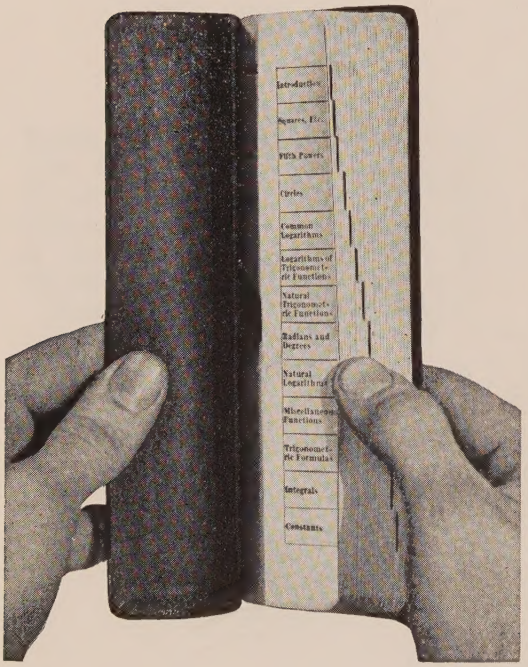

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Introduction

Squares, Etc.

Fifth Powers

Circles

Common Logarithms

Logarithms of Trigonometric Functions

Natural Trigonometric Functions

Radians and Degrees

Functions of Radians

Logarithms of Factorials

Natural Logarithms

Miscellaneous Functions

Trigonometric Formulas

Integrals

Constants

SIX-PLACE TABLES

A Selection of
Tables of Squares, Cubes, Square Roots, Cube Roots, Fifth Roots and Powers, Circumferences and Areas of Circles, Common Logarithms of Numbers and of the Trigonometric Functions, the Natural Trigonometric Functions, Natural Logarithms, Exponential and Hyperbolic Functions, and Integrals

With Explanatory Notes by

EDWARD S. ALLEN

Professor of Mathematics
Iowa State College

Seventh Edition

McGRAW-HILL BOOK COMPANY, Inc.

NEW YORK AND LONDON

1947

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SIX-PLACE TABLES

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THE MAPLE PRESS COMPANY, YORK, PA.

PREFACE

The main improvement in this edition is the expansion of the tables of Natural Logarithms (Table X) and of Exponential and Hyperbolic Functions (Table XI) to six-place accuracy.

Again the editor wishes to thank those who have pointed out desirable corrections and additions. He will be pleased to receive further suggestions for making the book still more useful.

EDWARD S. ALLEN.

AMES, IOWA,
January, 1947.

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INTRODUCTION

THEORY OF LOGARITHMS, AND EXPLANATION OF TABLES

I. Definition.

Let a be a positive number other than 1, and x any positive number. It can be proved that some real number (positive, zero, or negative), used as an exponent of a, will produce x.

The number which, when used as exponent of a, gives x (or, more briefly, the exponent of a producing x) is called the logarithm, to the base a, of x.

For instance, since $3^4 = 81$, *i.e.*, the exponent of 3 producing 81 is 4, $\log_3 81 = 4$.

Likewise, if the equation

$$\log_x 27 = -3$$

is to be solved, it may be written in the form

$$x^{-3} = 27.$$

Hence

$$x^{-1} = 3$$

and

$$x = \tfrac{1}{3}.$$

II. Theorems.

The value of logarithms in computation results from a few simple theorems. To obtain these theorems, let it be recalled that the phrase "the logarithm, to the base a, of" means the same as "the exponent of a producing."

1. Let a^p and a^q be any two positive numbers. It is known that

$$(a^p)(a^q) = a^{p+q}.$$

The exponent of a producing the first factor on the left is, clearly, p. The exponent of a producing the second factor on the left is q. The exponent of a producing the product is $p + q$, the sum of the exponents of a producing the factors. If this statement is generalized to the case of any number of factors, and translated into the language of logarithms, it shows that *the logarithm, to the base a of a product, is the sum of the logarithms, to the same base, of its factors.*

2. Again, since

$$\frac{a^p}{a^q} = a^{p-q},$$

the exponent of a producing a quotient is the difference between the exponents producing the numerator and the denominator. That is, *the logarithm, to the base a, of a quotient equals the logarithm of the numerator minus that of the denominator.*

3. $$(a^p)^q = a^{pq},$$

where, again, a^p is any positive number, p and q any real numbers. The exponent of a producing the number in parenthesis is p. The exponent of a producing the qth power of that number is pq. Therefore, *the logarithm, to the base a, of the qth power of a number is q times the logarithm, to the same base, of the number.*

These theorems make it possible to find the logarithms of all positive rational numbers and their roots in terms of the logarithms of prime numbers. For instance,

$$\log 21 = \log ((3)(7)) = \log 3 + \log 7$$
$$\log \tfrac{16}{27} = \log 16 - \log 27 = \log 2^4 - \log 3^3$$
$$= 4 \log 2 - 3 \log 3$$
$$\log 144 = \log ((2^4)(3^2)) = 4 \log 2 + 2 \log 3$$
$$\log \sqrt[5]{\tfrac{91}{100}} = \tfrac{1}{5}(\log 7 + \log 13 - 2 \log 2 - 2 \log 5)$$

III. Logarithms to the Base 10.

It must always be kept in mind that the explanations in Sections III–VI *apply to logarithms with base* 10 *only.* These are called *common logarithms.*

(*a*) *Numbers between* 1 *and* 10.

Since $10^0 = 1$, $\log_{10} 1 = 0$;
and, since $10^1 = 10$, $\log_{10} 10 = 1$.
It is, likewise, obvious that $\log_{10} 100 = 2$, $\log_{10} 1000 = 3$, etc., and that $\log_{10} .1 = -1$, $\log_{10} .01 = -2$, etc.

When a number increases, its logarithm (to any base greater than 1) increases. It follows, therefore, from the first two logarithmic equations of this section that the logarithms (to the base 10) of numbers *between* 1 and 10 lie *between* 0 and 1. The tables on pages 24 to 50 consist of the logarithms of those numbers, between 1 and 10, which have not over three decimal figures. The logarithms are, of course, not exactly correct, but the errors do not affect the six decimal figures which are given.

To economize space, the publishers of tables of logarithms usually omit all decimal points. Since the numbers, on the

pages referred to, are between 1 and 10, they should have a decimal point inserted after the first digit. The logarithms, being between 0 and 1, need a decimal point before the first digit.

Space is further saved in these tables by the omission of the first two decimal figures of most logarithms. Horizontal lines in the body of the tables separate logarithms beginning with one pair of digits from those beginning with another pair. The numbers occupy the first column, their logarithms the next ten. Examples will best explain these details; *it is*, of course, *very important that the student verify the details of all illustrative examples.*

On page 29 the top line shows that

$$\log 1.700 = .230449$$
$$\log 1.701 = .230704, \text{ etc.}$$

The second line shows that

$$\log 1.717 = .234770,$$

and the fourth line, that

$$\log 1.737 = .239800$$
$$\log 1.738 = .240050.$$

To find x, where

$\log x = .784831$, one turns to page 41, where all logarithms beginning with .78 are found, and discovers that

$$.784831 = \log 6.093,$$

so that $x = 6.093$.

(*b*) *Numbers not between* 1 *and* 10.

If any positive number is divided by the largest integral power (positive, zero, or negative) of 10, which is not greater than the number, the quotient is less than 10, but not less than 1. In other words, *every positive number is the product of an integral power of* 10, *and of a number less than* 10 *but not less than* 1.

For example:

$$\begin{aligned} 324 &= (100)(3.24) &&= (10^2)(3.24) \\ 4.312 &= (1)(4.312) &&= (10^0)(4.312) \\ .01 &= (.01)(1) &&= (10^{-2})(1) \\ .002345 &= (.001)(2.345) &&= (10^{-3})(2.345) \end{aligned}$$

Now, the logarithm of a product is the sum of the logarithms of its factors: the logarithm of an integral power of 10 is an integer, and the logarithm of a number less than 10, but not less than 1, is less than 1 but not negative. Accordingly,

every logarithm is the sum of an integer and of a number less than 1 *but not less than* 0; and the two terms are, respectively, the logarithms of the factors named at the beginning of this section. The integral term is called the *characteristic* of the logarithm, while the non-negative term less than 1 is called the *mantissa.*

The logarithms of the numbers factored on page xi are found as follows:

$$\begin{aligned}
\log 324 &= \log 10^2 + \log 3.24 = 2 + .510545 \\
\log\ 4.312 &= 0 + .634679 = .634679 \\
\log\ .01 &= -2 + 0 \\
\log\ .002345 &= -3 + .370143
\end{aligned}$$

In every case, the first term of the second member is the characteristic, the second term the mantissa of the logarithm. It is now clear that the tables on pages 24 to 50 show, not merely the logarithms of numbers between 1 and 10, but the *mantissas* of the logarithms of *all* numbers of four significant figures.

It is convenient to write negative characteristics—like those in the last two cases—as the sum of a positive integer and of the smallest available multiple of (-10). Thus we write

$$\begin{aligned}
\log .01 &= 8.000000 - 10 \\
\log .002345 &= 7.370143 - 10
\end{aligned}$$

A very convenient rule for determining the characteristic of the logarithm of a number, and of placing the decimal point in a number whose logarithm has a given characteristic, is the following:

The normal position of a number's decimal point (that of numbers whose complete logarithms are found in the tables) *follows the first significant figure. The displacement of the actual decimal point to the right of this position gives the characteristic of the logarithm of the number.*

Thus, if a carat (∧) is placed at the normal position, it is seen that

log	324.	must have characteristic 2
	∧	
log	4.312	must have characteristic 0
	∧	
log	.01∧	must have characteristic −2
log	.002345	must have characteristic −3,
	∧	

as was seen to be the case above.

Similarly, if a logarithm above 1 or below 0 is given, it is clear that its two *terms*—characteristic and mantissa—are loga-

rithms of two *factors* of the corresponding number. The characteristic is the logarithm of a power of 10, and can be determined without the tables; the mantissa is the logarithm of a factor to be found by the use of the tables.

For example, if

$$\begin{aligned} \log x &= 2.375115 \\ &= 2 + .375115 \\ &= \log 10^2 + \log 2.372, \end{aligned}$$

then $x = (10^2)(2.372) = 237.2.$

Likewise, if

$$\begin{aligned} \log x &= 7.472171 - 10 \\ &= -3 + .472171 \\ &= \log 10^{-3} + \log 2.966, \end{aligned}$$

then $x = (10^{-3})(2.966) = .002966.$

Clearly, then, the mantissa of a logarithm determines the digits in the corresponding number, while the characteristic fixes the position of the decimal point.

IV. Computation with Logarithms.

The theorems in Section II form the basis of computation by means of logarithms. A few examples will illustrate their use in multiplication, division, involution, and evolution of positive numbers.

Ex. 1. Find y, where

$$y = (2.371)(3.125)(1.111).$$

From Theorem 1,

$$\log y = \log 2.371 + \log 3.125 + \log 1.111$$

$$\begin{aligned} \log 2.371 &= .374932 \\ \log 3.125 &= .494850 \\ \log 1.111 &= .045714 \\ \hline \log y &= .915496 \\ y &= 8.232 \end{aligned}$$

Since 8.232 is the number whose logarithm in the tables (.915505) is nearest to .915496, we write $y = 8.232$, realizing that we are obtaining only four-place accuracy.

In this example, as in all logarithmic computation, the work will be more quickly and accurately done, if a framework with blanks for all unknown numbers is written before the tables are used. In the previous example, the first members of all equations in the column were written, and the tables then consulted.

Ex. 2. Find y, where

$$y = \frac{(1.629)(56.21)}{03163}$$

From Theorems 1 and 2,

$$\log y = \log 1.629 + \log 56.21 - \log .03163$$

$$\begin{aligned}
\log 1.629 &= .211921 \\
\log 56.21 &= 1.749814 \\
&\quad\overline{1.961735} \\
&= 11.961735 - 10 \\
\log .03163 &= 8.500099 - 10 \\
\log y &= 3.461636 \\
y &= 2895.
\end{aligned}$$

The logarithm, 1.961735, was changed to $11.961735 - 10$, so that, after subtraction, there should be no negative fractional term in any logarithm.

Ex. 3. Find y, where

$$y = \frac{(.1714)(2.715)^{\frac{3}{2}}}{(317.3)^{\frac{2}{3}}}$$

From Theorems 1, 2, and 3,

$$\begin{aligned}
\log y &= \log .1714 + \log (2.715)^{\frac{3}{2}} - \log (317.3)^{\frac{2}{3}} \\
&= \log .1714 + \tfrac{3}{2} \log 2.715 - \tfrac{2}{3} \log 317.3
\end{aligned}$$

$$\begin{aligned}
\log .1714 &= 9.234011 - 10 \\
\log 2.715 = .433770 \quad \tfrac{3}{2} \log 2.715 &= .650655 \\
&\quad\overline{9.884666 - 10} \\
\log 317.3 = 2.501470 \quad \tfrac{2}{3} \log 317.3 &= 1.667647 \\
\log y &= 8.217019 - 10 \\
y &= .01648
\end{aligned}$$

The following methods of shortening logarithmic work, while not indispensable, are important aids to computation.

Multiplication of negative logarithms by fractions.

Ex. 4. If the value of $(.7293)^{\frac{3}{2}}$ is desired, the computation *may* be written as follows:

$$\begin{aligned}
\log .7293 &= 9.862906 - 10 \\
&\qquad\qquad 2 \\
\log (.7293)^2 &= 19.725812 - 20 \\
\log (.7293)^{\frac{3}{2}} &= 6.575271 - 6.666667
\end{aligned}$$

As it is not, however, convenient to have any negative terms, other than multiples of 10, in logarithms, the following form is preferable:

$$\begin{aligned}
\log .7293 &= 9.862906 - 10 \\
\log (.7293)^2 &= 19.725812 - 20 \\
&= 29.725812 - 30 \\
\log (.7293)^{\frac{3}{2}} &= 9.908604 - 10 \\
(.7293)^{\frac{3}{2}} &= .8102
\end{aligned}$$

This suggests the following rule:

Any negative logarithm which is to be divided by an integer should be written so that its negative term is ten times that divisor.

Cologarithms.

The *cologarithm* of a number is the logarithm of its reciprocal. Or, since $\log \frac{1}{x} = \log 1 - \log x = 0 - \log x$, the cologarithm of a number is the negative of its logarithm. As division by a number is multiplication by its reciprocal, we can avoid subtracting the logarithm of a factor of a divisor by adding the cologarithm of the factor. The cologarithm is found by subtracting the logarithm from 0 in the form (10 − 10) − or, if need be, (20 − 20), etc. When a positive number under 10 is subtracted from 10, the last digit which is not 0 is subtracted from 10, all previous ones from 9.

Ex. 5. Compute the value of y, where

$$y = \frac{(1.415)(21.71)}{(16.34)(.04735)}$$

$$\begin{aligned} \log\ 1.415 &= .150756 \\ \log\ 21.71 &= 1.336660 \\ \log\ 16.34 = 1.213252 \quad \operatorname{colog}\ 16.34 &= 8.786748 - 10 \\ \log\ .04735 = 8.675320 - 10 & \\ \operatorname{colog}\ .04735 &= 1.324680 \\ \log y &= 1.598844 \\ y &= 39.70 \end{aligned}$$

V. Interpolation.

In Section III we saw how to find the logarithm of a number of four significant figures, and how to find four digits of a number whose logarithm was given. We can also use the tables to obtain logarithms of numbers of more figures, and to obtain such numbers from their logarithms.

The method used is called *interpolation*. It depends on the fact that small differences between numbers are approximately proportional to the differences between their logarithms. Let us first verify this with three logarithms given in the tables.

$$.003\left[\begin{array}{l} .002\left[\begin{array}{l}\log\ 9.053 = .956793 \\ \log\ 9.055 = .956888\end{array}\right] .000095 \\ \log\ 9.056 = .956936 \end{array}\right] .000143$$

The numbers given outside the brackets are the differences between corresponding numbers named in the equations. It is approximately true that $\frac{.002}{.003} = \frac{.000095}{.000143}$; *i.e.*, 9.055 is $\frac{2}{3}$ of the way from 9.053 to 9.056, so that its logarithm, .956888, is $\frac{2}{3}$ of the way from .956793 to .956936.

Ex. 1. We will now apply the same principle to the determination of log 4.1723. 4.1723 is $\frac{3}{10}$ of the way from 4.172 to 4.173 − numbers whose logarithms are in the tables. Their logarithms are .620344 and .620448, respectively, with a difference of .000104. $\frac{3}{10}$ of this is .0000312; accordingly

$$\log 4.1723 = .620344 + .000031 = .620375.$$

A convenient form is the following:

$$.0010\left[\begin{array}{l} .0003\left[\begin{array}{l}\log 4.1720 = .620344\\ \log 4.1723 = .620375\end{array}\right]x \\ \log 4.1730 = .620448 \end{array}\right].000104$$

$$\frac{.0003}{.0010} = \frac{x}{.000104}, \text{ so that } x = .000031$$

Space can be saved if it be agreed that the numbers outside the brackets need not represent units, but may indicate the number of thousandths, etc. Thus, the interpolation given above could be written as follows:

$$10\left[\begin{array}{l} 3\left[\begin{array}{l}\log 4.1720 = .620344\\ \log 4.1723 = .620375\end{array}\right]x \\ \log 4.1730 = .620448 \end{array}\right]104$$

Here the numbers outside the left-hand brackets indicate ten-thousandths, those outside the brackets to the right, millionths. We neglect the .2 in 31.2, as that would give a seven-place logarithm, and we can expect only six-place accuracy from six-place tables. If the seventh decimal figure of a logarithm, found by interpolation, is 5, the even digit in the sixth is chosen. Thus, if interpolation gave the value of a logarithm as either .6234555 or .6234565, the corresponding six-place logarithm would be .623456.

The computation is made easier by the use of the column headed "Diff." and the table of proportional parts; the latter is, in substance, a multiplication table. To the right of 4.172 is found 104, the difference between successive logarithms in this section of the tables (at times this may give a slight error, easily detected). To the right of 104, at the bottom of the page, is a multiplication table for 104, from which it appears that (.3)(104) = 31.2.

Ex. 2. As a further example, let us find log 71.6327

$$100\left[\begin{array}{l} 27\left[\begin{array}{l}\log 71.6300 = 1.855095\\ \log 71.6327 = 1.855111\end{array}\right]x \\ \log 71.6400 = 1.855156 \end{array}\right]61$$

$$\frac{27}{100} = .27 = \frac{x}{61}$$

$$x = (.27)(61) = 12.2 + 4.27 = \mathbf{16.47}.$$

If a logarithm is given, whose mantissa is not in the tables, similar considerations will yield the corresponding number.

Ex. 3. Let $\log n = 1.730000$, and n be desired.

Looking for the logarithms just below and just above .730000 (p. 41), we have

$$100\left[x\left[\begin{matrix}\log 5.37000 &= .729974\\ \log .1n &= .730000\\ \log 5.37100 &= .730055\end{matrix}\right]26\right]81$$

$$\frac{x}{100} = \frac{26}{81} = \frac{24.3}{81} + \frac{1.7}{81} = \frac{24.3}{81} + \left(\frac{1}{10}\right)\left(\frac{17}{81}\right) = .3 + .02$$

$$x = 32$$

$$.1n = 5.37032$$

$$n = 53.7032$$

24.3, found as that number in the row beginning with 81 (in the table of proportional parts) which is just below 26, is subtracted from 26 to yield 1.7.

After some practice, the student will learn to abbreviate this form of interpolation safely.

Ex. 4. As a final example, illustrating the methods given in this and the previous sections, let us find the value of x, where

$$x = \frac{(2.73125)(.471462)^{.43}}{(41.7124)(.231762)^{\frac{3}{4}}}$$

		$\log 2.73125$	$= .436362$
$\log .471462$	$= 9.673447 - 10$		
	$.43$		
$\log (.471462)^{.43}$	$= 4.159582 - 4.3$		$= 9.859582 - 10$
$\log 41.7124$	$= 1.620265$	$\operatorname{colog} 41.7124$	$= 8.379735 - 10$
$\log .231762$	$= 9.365042 - 10$		
$\operatorname{colog}. 231762$	$= .634958$		
	3		
$\operatorname{colog} (.231762)^3$	$= 1.904874$	$\operatorname{colog} (.231762)^{\frac{3}{4}}$	$= .476218$
		$\log x$	$= 19.151897 - 20$
		x	$= .141872$

VI. Logarithmic Computation Involving Trigonometric Functions.

On pages 52 to 96 are found the logarithms of the sine, cosine, tangent, and cotangent of every angle between 0° and 45° which consists of a whole number of minutes. Since the functions of any angle equal those of some angle between 0° and 45°—in some cases with change of sign, and in some with interchange of each function and its cofunction—Table V gives the means for logarithmic computation involving any angles whatever.

Regarding the tables, the following comments should be kept in mind.

1. 10 must be subtracted from each logarithm as given.

2. On every page, at the four corners, are four numbers of degrees. Each one of these is to be used in connection with the number of minutes and the names of the functions in the adjacent margins. In cases where the function (cosine, tangent, or cotangent) is negative, the tables give log $(-\cos\theta)$, etc., since negative numbers have no real logarithms.

Thus the same logarithm in the tables (p. 59) shows that

$$\begin{aligned}
&\log \cos 7^\circ 22' &&= 9.996400 - 10\\
&\log (-\cos 172^\circ 38') &&= 9.996400 - 10\\
&\log \sin 82^\circ 38' &&= 9.996400 - 10\\
&\log \sin 97^\circ 22' &&= 9.996400 - 10.
\end{aligned}$$

Or, if the equation

$$\log \tan \theta = .615214$$

is to be solved, it is found (p. 65) that

$$\theta = 76^\circ 22'.$$

With regard to interpolation, the next three paragraphs are important.

3. On pages 52 and 53, interpolation in the first three columns should be performed by the method described on pages 50 and 51.

4. In all other cases, the column marked "D. 1″" gives $\frac{1}{10}$ of the difference between successive logarithms. This is, of course, the change of logarithm corresponding to a change of 1 second in the angle.

For example, let log sin 9° 22′ 25″ be desired.

$$\begin{aligned}
&\log \sin 9^\circ 22' &&= 9.211526 - 10\\
&(25)(12.75) &&= \quad 319\\
&\log \sin 9^\circ 22' 25'' &&\\
&&&= 9.211845 - 10
\end{aligned}$$

Similarly, if $\log \tan \theta = .762451$

$$\begin{aligned}
&\log \tan 80^\circ 11' &&= .761880\\
&\text{Difference} &&= \quad 571
\end{aligned}$$

$$\begin{aligned}
&\text{D.1}'' &&= 12.53\\
&571 &&\\
&12.53 &&= 46
\end{aligned}$$

Therefore

$$\theta = 80^\circ 11' 46''.$$

5. It should always be noted, of course, whether an increase in an angle causes an increase or a decrease in the logarithm of the function under consideration.

To find log sin 99° 37′ 37″, for instance, notice that

$$\begin{aligned} &\log \sin 99^\circ\, 37' && = 9.993854 - 10 \\ &37 \text{ (D. } 1'') = (37)(.37) = && \quad 14 \\ &\log \sin 99^\circ\, 37'\, 37'' && = 9.993840 - 10 \end{aligned}$$

14 is *subtracted* because, as the tables show, log sin 99° 38′ is *less* than log sin 99° 37′.

Similarly, let θ be required, it being given that

$$\begin{aligned} &\log \cot \theta && = .172271 \\ &\log \cot 33^\circ\, 55' && = .172376 \\ &\text{Difference} && = -105 \\ &\text{D. } 1'' && = -4.55 \\ &\frac{-105}{-4.55} && = \quad 23 \\ &\theta && = 33^\circ\, 55'\, 23'' \end{aligned}$$

As a final example of the use of logarithms, let θ be found where

$$\cot \theta = \frac{(\sin 43^\circ\, 47'\, 34'')^{\frac{2}{3}}}{(.16245)^2 (472.15)^{\frac{1}{2}}}$$

$$\begin{aligned} &\log \sin 43^\circ\, 47'\, 34'' && = 9.840139 = 10 \\ &\tfrac{2}{3} \log \sin 43^\circ\, 47'\, 34'' && = 9.893426 = 10 \\ &2 \operatorname{colog} .16245 && = 1.578560 \\ &\tfrac{1}{2} \operatorname{colog} 472.15 && = 8.662960 = 10 \\ &\log \cot \theta && = .134946 \\ &\theta && = 36^\circ\, 14'\, 18'' \end{aligned}$$

VII. Trigonometric Functions.

The tables giving the logarithms of numbers and of trigonometric functions having been described, a short account of the tables of trigonometric functions is in order.

Table VI, pages 97 to 141, gives the value of sines, cosines, tangents, cotangents, secants and cosecants. Concerning these tables, the following explanations will be useful.

1. As in Table V, each page has four numbers of degrees. Here again, a number at the top of the page is to be used in connection with the names of functions at the top, a number at the bottom with functions at the bottom; a number of degrees at the left is to be read with a number of minutes at the left, degrees at the right with minutes at the right. Of course negative signs must be supplied, according to trigonometric theory, with certain functions of any outside the first quadrant.

2. No aids to interpolation—such as tabular differences and tables of proportional parts—are given. Interpolation is performed according to elementary principles, the tabular difference being found by the computer. It is necessary, of course, to notice whether an increase in the angle causes an increase or a decrease in the function concerned.

3. Interpolation carried on in this way will in general cause no error above 1 in the last figure of the function obtained or above 1″ in the angle found. Regions in which interpolation has *not* this degree of safety are approximately as follows:

When functions are found from angles:

The interval $75° < x < 90°$ for tan x and sec x.

When angles are found from functions:

The interval $84° < x < 90°$ for sin x.

The interval $89°\ 30' < x < 90°$ for tan x.

The intervals $0° < x < 6°$ and $89°\ 30' < x < 90°$ for sec x.

The regions unsafe for interpolation in connection with the other functions, and for all functions of angles outside the first quadrant, can be found easily from the list given above.

As an example, suppose that tan 16° 17′ 24″ is desired. With the aid of page 113 of the tables the number wished is found in the familiar form, as follows:

$$60\left[\begin{array}{l} 24\left[\begin{array}{ll} \tan\ 16°\ 17' & = .292105 \\ \tan\ 16°\ 17'\ 24'' & = .292231 \end{array}\right] x \\ \tan\ 16°\ 18' \quad = .292420 \end{array}\right] 315$$

$$\frac{24}{60} = \frac{x}{315}$$

$$x = 126$$

Again, let θ be desired, such that

$$\cos\theta = .567101$$

$$60\left[\begin{array}{l} x\left[\begin{array}{ll} \cos\ 55°\ 27' & = .567125 \\ \cos\theta & = .567101 \end{array}\right] - 24 \\ \cos\ 55°\ 28' \quad = .566886 \end{array}\right] - 239$$

$$\frac{x}{60} = \frac{-24}{-239}$$

As x is approximately 6, $\theta = 55°\ 27'\ 6''$.

VIII. Tables of Natural Logarithms, and of Exponential and Hyperbolic Functions.

10 is not the most convenient base of logarithms for all purposes. Another important base is the constant

$$e = 1 + 1 + \frac{1}{2!} + \frac{1}{3!} + \ . \ . \ . \ = 2.71828 \ . \ . \ .$$

Logarithms to the base e are called *natural logarithms.*

By the definition of logarithms (Section II) the two equations

$$e^x = n$$

and

$$\log_e n = x$$

have the same meaning. In these equations Table X gives the value of x, when that of n is known. Conversely, the first three columns of Table XI show the value of n corresponding to a given x.

Thus it is found, on pages 151 and 154, that

$$\left.\begin{array}{l}\log\ .14 = -1.966113\\ \log\ 1.4 = .336472\end{array}\right\} \text{or the equivalent equations} \left\{\begin{array}{l}e^{-1.966113} = .14\\ e^{.336472} = 1.4\end{array}\right.$$

On pages 201 and 178, Table XI shows that

$$e^{-1.966} = .140016 \qquad e^{.336} = 1.399339$$
$$e^{-1.968} = .139736 \qquad e^{.337} = 1.400739$$

Obviously, each table could be obtained from the other, approximately, by interpolation.

Table X gives natural logarithms complete (to six decimal places)—not merely, as do tables of common logarithms, the decimal terms (mantissas). *The natural logarithms of two such numbers as* .14 *and* 1.4 *do not differ by whole numbers, but by multiples of* $\log_e 10$ (= 2.302585). Thus,

$$\log_e 1.4 - \log_e .14 = .336472 - (-1.966113) = 2.302585 = \log_e 10$$

Logarithms of numbers outside the range of Table X may be found by adding or subtracting multiples of log 10. Thus,

$$\begin{aligned}\log 1580 &= \log 1.580 + 3 \log 10\\ &= .457425 + 6.907755\\ &= 7.365180\\ \log .002 &= \log .2 - 2 \log 10\\ &= -1.609438 - 4.605170 = -6.214618\end{aligned}$$

The meaning of the first three columns of Table XI is obvious. The other three columns show the values of the hyperbolic sine, hyperbolic cosine, and hyperbolic tangent of x, functions defined as follows:

$$\sinh x = \frac{e^x - e^{-x}}{2} \qquad \coth x = \frac{1}{\tanh x}$$
$$\cosh x = \frac{e^x + e^{-x}}{2} \qquad \operatorname{sech} x = \frac{1}{\cosh x}$$
$$\tanh x = \frac{e^x - e^{-x}}{e^x + e^{-x}} \qquad \operatorname{csch} x = \frac{1}{\sinh x},$$

The *inverses* of these functions are readily found to be given by the equations:

$$\sinh^{-1} x = \log (x + \sqrt{x^2 + 1}) \qquad \coth^{-1} x = \tfrac{1}{2} \log \frac{x+1}{x-1}$$

$$\cosh^{-1} x = \log (x + \sqrt{x^2 - 1}) \qquad \operatorname{sech}^{-1} x = \log \frac{1 + \sqrt{1 - x^2}}{x}$$

$$\tanh^{-1} x = \tfrac{1}{2} \log \frac{1+x}{1-x} \qquad \operatorname{csch}^{-1} x = \log \frac{1 + \sqrt{1 + x^2}}{x}$$

IX. Exercises.

The numbering of the exercises is the same as that of the sections which they illustrate.

I. Find n when:

(*a*) $\log_2 \frac{1}{4} = n$ (*d*) $\log_n \frac{1}{27} = -3$ (*g*) $n = \log_2 2^5$

(*b*) $\log_4 2 = n$ (*e*) $\log_8 n = -2$ (*h*) $n = 2^{\log_2 5}$

(*c*) $\log_n 8 = \frac{3}{2}$ (*f*) $\log_{\frac{1}{3}} 81 = n$ (*i*) $n = 3^{\log \sqrt{3}}$

II. Write in terms of logarithms of prime numbers:

(*a*) $\log 72$ (*c*) $\log \frac{4}{125}$ (*e*) $\log (\frac{4}{7})^{\frac{3}{2}}$

(*b*) $\log \frac{1}{625}$ (*d*) $\log \sqrt[3]{\frac{49}{12}}$ (*f*) $\log (\frac{1}{3}\frac{3}{4}\frac{2}{5})^{-\frac{1}{3}}$

III. Find the logarithms, to the base 10, of the following numbers:

(*a*) 4.562 (*c*) 4.500 (*e*) .00692

(*b*) 4.571 (*d*) 127.1 (*f*) 147200

Find x, correct to four significant figures, when:

(*g*) $\log x = .910091$ (*j*) $\log x = 3.468000$

(*h*) $\log x = .896030$ (*k*) $\log x = 8.595827 - 10$

(*i*) $\log x = 1.630021$ (*l*) $\log x = 1.690019$

IV. Find the values of the following, correct to four significant figures:

(*a*) $(4.732)(1.790)$ (*d*) $(1.146)^5$ (*g*) $(.7321)^{\frac{1}{3}}$

(*b*) $\dfrac{4.732}{1.790}$ (*e*) $\dfrac{(47.61)(15.91)^3}{(.07134)^2(.1462)}$ (*h*) $\dfrac{(13.72)^2}{(5.716)^{\frac{1}{3}}}$

(*c*) $\dfrac{(2.735)(17.90)}{(31.78)(124.7)}$ (*f*) $\sqrt[3]{(1.146)(2.732)}$ (*i*) $\dfrac{2^{\frac{1}{3}} + 3^{\frac{1}{2}}}{5^{\frac{1}{4}} + 7^{\frac{1}{5}}}$

V. Find:

(*a*) $\log 4.56271$ (*b*) $\log 524.67$ (*c*) $\log .00721345$

Find x, correct to six significant figures, when:

(*d*) $\log x = .345678$ (*e*) $\log x = 3.468024$

(*f*) $\log x = 8.692570 - 10$

Evaluate, correct to six significant figures:

(*g*) $(2.7351)(1.2345)(1.8792)$

(*h*) $\sqrt[3]{(1.1456)(273.241)}$

(*i*) $\sqrt{\frac{7}{30}}$ (*l*) $(.72654)^2$

(*j*) $\left[\frac{.071321}{(3.614)(1.7321)}\right]^{\frac{1}{3}}$ (*m*) $\frac{(.31416)^{.4}}{(453.75)^2(13.71)}$

(*k*) $\frac{(67.123)^2 + (71.324)^2 - (80.125)^2}{2(67.123)(71.324)}$

VI. Find:

(*a*) log sin 70° 23′

(*b*) log tan 10° 14′ 13″

(*c*) log (−cot 97° 2′ 4″)

(*d*) log tan 1° 2′ 5″ [see p. 50]

(*e*) log cos 70° 1′ 3″

Solve, correct to six significant figures or to seconds:

(*f*) log sin θ = 9.970635 − 10

(*g*) log tan θ = .324165

(*h*) log (−cos θ) = 9.321794 − 10 [In what quadrant is θ?]

(*i*) log sin θ = 8.015414 − 10

(*j*) $x = \frac{14.235 \sin 95° 4' 16''}{\sin 25° 42' 13''}$

(*k*) $x = \frac{53.013 \sin 63° 14' 5''}{\tan^2 14° 5' 36''}$

(*l*) $\tan\theta = \frac{.43124 \sin 13° 13' 13''}{.53516 \cos 72° 14' 2''}$

VII. Solve without logarithms, correct to six significant figures or to seconds:

(*a*) x = cos 72° 14′

(*b*) sin θ = .215588

(*c*) cot θ = −.399970

(*d*) x = tan 43° 32′ 16″

(*e*) cos θ = .312445

(*f*) tan θ = −1.620452

(*g*) $\sin\theta = \frac{13 \sin 10° 26'}{28}$

(*h*) $x = \frac{312.7}{\cos 34° 42' 14''}$

(*i*) $\tan(\theta - 45°) = \frac{15 \sin 33° - 33 \sin 15°}{15 \sin 33° + 33 \sin 15°}$

(*g*) $x \sin 20° 17' 13'' - y \cos 20° 17' 13'' = 5$

$x \cos 20° 17' 13'' + y \sin 20° 17' 13'' = 8$

TABLE [1]

SQUARES, CUBES, SQUARE AND CUBE ROOTS, CIRCUMFERENCES, AND AREAS

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
1	1	1	1.0000	1.0000	1.000000000	3.1416	0.7854
2	4	8	1.4142	1.2599	.500000000	6.2832	3.1416
3	9	27	1.7321	1.4422	.333333333	9.4248	7.0686
4	16	64	2.0000	1.5874	.250000000	12.5664	12.5664
5	25	125	2.2361	1.7100	.200000000	15.7080	19.635
6	36	216	2.4495	1.8171	.166666667	18.850	28.274
7	49	343	2.6458	1.9129	.142857143	21.991	38.485
8	64	512	2.8284	2.0000	.125000000	25.133	50.266
9	81	729	3.0000	2.0801	.111111111	28.274	63.617
10	100	1,000	3.1623	2.1544	.100000000	31.416	78.540
11	121	1,331	3.3166	2.2240	.090909091	34.558	95.033
12	144	1,728	3.4641	2.2894	.083333333	37.699	113.10
13	169	2,197	3.6056	2.3513	.076923077	40.841	132.73
14	196	2,744	3.7417	2.4101	.071428571	43.982	153.94
15	225	3,375	3.8730	2.4662	.066666667	47.124	176.71
16	256	4,096	4.0000	2.5198	.062500000	50.265	201.06
17	289	4,913	4.1231	2.5713	.058823529	53.407	226.98
18	324	5,832	4.2426	2.6207	.055555556	56.549	254.47
19	361	6,859	4.3589	2.6684	.052631579	59.690	283.53
20	400	8,000	4.4721	2.7144	.050000000	62.832	314.16
21	441	9,261	4.5826	2.7589	.047619048	65.973	346.36
22	484	10,648	4.6904	2.8020	.045454545	69.115	380.13
23	529	12,167	4.7958	2.8439	.043478261	72.257	415.48
24	576	13,824	4.8990	2.8845	.041666667	75.398	452.39
25	625	15,625	5.0000	2.9240	.040000000	78.540	490.87
26	676	17,576	5.0990	2.9625	.038461538	81.681	530.93
27	729	19,683	5.1962	3.0000	.037037037	84.823	572.56
28	784	21,952	5.2915	3.0366	.035714286	87.965	615.75
29	841	24,389	5.3852	3.0723	.034482759	91.106	660.52
30	900	27,000	5.4772	3.1072	.033333333	94.248	706.86
31	961	29,791	5.5678	3.1414	.032258065	97.389	754.77
32	1,024	32,768	5.6569	3.1748	.031250000	100.53	804.25
33	1,089	35,937	5.7446	3.2075	.030303030	103.67	855.30
34	1,156	39,304	5.8310	3.2396	.029411765	106.81	907.92
35	1,225	42,875	5.9161	3.2711	.028571429	109.96	962.11
36	1,296	46,656	6.0000	3.3019	.027777778	113.10	1,017.88
37	1,369	50,653	6.0828	3.3322	.027027027	116.24	1,075.21
38	1,444	54,872	6.1644	3.3620	.026315789	119.38	1,134.11
39	1,521	59,319	6.2450	3.3912	.025641026	122.52	1,194.59
40	1,600	64,000	6.3246	3.4200	.025000000	125.66	1,256.64
41	1,681	68,921	6.4031	3.4482	.024390244	128.81	1,320.25
42	1,764	74,088	6.4807	3.4760	.023809524	131.95	1,385.44
43	1,849	79,507	6.5574	3.5034	.023255814	135.09	1,452.20
44	1,936	85,184	6.6332	3.5303	.022727273	138.23	1,520.53
45	2,025	91,125	6.7082	3.5569	.022222222	141.37	1,590.43
46	2,116	97,336	6.7823	3.5830	.021739130	144.51	1,661.90
47	2,209	103,823	6.8557	3.6088	.021276596	147.65	1,734.94
48	2,304	110,592	6.9282	3.6342	.020833333	150.80	1,809.56
49	2,401	117,649	7.0000	3.6593	.020408163	153.94	1,885.74
50	2,500	125,000	7.0711	3.6840	.020000000	157.08	1,963.50
51	2,601	132,651	7.1414	3.7084	.019607843	160.22	2,042.82
52	2,704	140,608	7.2111	3.7325	.019230769	163.36	2,123.72
53	2,809	148,877	7.2801	3.7563	.018867925	166.50	2,206.18
54	2,916	157,464	7.3485	3.7798	.018518519	169.65	2,290.22
55	3,025	166,375	7.4162	3.8030	.018181818	172.79	2,375.83

[1] Pages 1 to 16 and 19 to 23 from "Coal Miners' Pocketbook."

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum	Area
56	3,136	175,616	7.4833	3.8259	.017857143	175.93	2,463.01
57	3,249	185,193	7.5498	3.8485	.017543860	179.07	2,551.76
58	3,364	195,112	7.6158	3.8709	.017241379	182.21	2,642.08
59	3,481	205,379	7.6811	3.8930	.016949153	185.35	2,733.97
60	3,600	216,000	7.7460	3.9149	.016666667	188.50	2,827.43
61	3,721	226,981	7.8102	3.9365	.016393443	191.64	2,922.47
62	3,844	238,328	7.8740	3.9579	.016129032	194.78	3,019.07
63	3,969	250,047	7.9373	3.9791	.015873016	197.92	3,117.25
64	4,096	262,144	8.0000	4.0000	.015625000	201.06	3,216.99
65	4,225	274,625	8.0623	4.0207	.015384615	204.20	3,318.31
66	4,356	287,496	8.1240	4.0412	.015151515	207.34	3,421.19
67	4,489	300,763	8.1854	4.0615	.014925373	210.49	3,525.65
68	4,624	314,432	8.2462	4.0817	.014705882	213.63	3,631.68
69	4,761	328,509	8.3066	4.1016	.014492754	216.77	3,739.28
70	4,900	343,000	8.3666	4.1213	.014285714	219.91	3,848.45
71	5,041	357,911	8.4261	4.1408	.014084507	223.05	3,959.19
72	5,184	373,248	8.4853	4.1602	.013888889	226.19	4,071.50
73	5,329	389,017	8.5440	4.1793	.013698630	229.34	4,185.39
74	5,476	405,224	8.6023	4.1983	.013513514	232.48	4,300.84
75	5,625	421,875	8.6603	4.2172	.013333333	235.62	4,417.86
76	5,776	438,976	8.7178	4.2358	.013157895	238.76	4,536.46
77	5,929	456,533	8.7750	4.2543	.012987013	241.90	4,656.63
78	6,084	474,552	8.8318	4.2727	.012820513	245.04	4,778.36
79	6,241	493,039	8.8882	4.2908	.012658228	248.19	4,901.67
80	6,400	512,000	8.9443	4.3089	.012500000	251.33	5,026.55
81	6,561	531,441	9.0000	4.3267	.012345679	254.47	5,153.00
82	6,724	551,368	9.0554	4.3445	.012195122	257.61	5,281.02
83	6,889	571,787	9.1104	4.3621	.012048193	260.75	5,410.61
84	7,056	592,704	9.1652	4.3795	.011904762	263.89	5,541.77
85	7,225	614,125	9.2195	4.3968	.011764706	267.04	5,674.50
86	7,396	636,056	9.2736	4.4140	.011627907	270.18	5,808.80
87	7,569	658,503	9.3274	4.4310	.011494253	273.32	5,944.68
88	7,744	681,472	9.3808	4.4480	.011363636	276.46	6,082.12
89	7,921	704,969	9.4340	4.4647	.011235955	279.60	6,221.14
90	8,100	729,000	9.4868	4.4814	.011111111	282.74	6,361.73
91	8,281	753,571	9.5394	4.4979	.010989011	285.88	6,503.88
92	8,464	778,688	9.5917	4.5144	.010869565	289.03	6,647.61
93	8,649	804,357	9.6437	4.5307	.010752688	292.17	6,792.91
94	8,836	830,584	9.6954	4.5468	.010638298	295.31	6,939.78
95	9,025	857,375	9.7468	4.5629	.010526316	298.45	7,088.22
96	9,216	884,736	9.7980	4.5789	.010416667	301.59	7,238.23
97	9,409	912,673	9.8489	4.5947	.010309278	304.73	7,389.81
98	9,604	941,192	9.8995	4.6104	.010204082	307.88	7,542.96
99	9,801	970,299	9.9499	4.6261	.010101010	311.02	7,697.69
100	10,000	1,000,000	10.0000	4.6416	.010000000	314.16	7,853.98
101	10,201	1,030,301	10.0499	4.6570	.009900990	317.30	8,011.85
102	10,404	1,061,208	10.0995	4.6723	.009803922	320.44	8,171.28
103	10,609	1,092,727	10.1489	4.6875	.009708738	323.58	8,332.29
104	10,816	1,124,864	10.1980	4.7027	.009615385	326.73	8,494.87
105	11,025	1,157,625	10.2470	4.7177	.009523810	329.87	8,659.01
106	11,236	1,191,016	10.2956	4.7326	.009433962	333.01	8,824.73
107	11,449	1,225,043	10.3441	4.7475	.009345794	336.15	8,992.02
108	11,664	1,259,712	10.3923	4.7622	.009259259	339.29	9,160.88
109	11,881	1,295,029	10.4403	4.7769	.009174312	342.43	9,331.32
110	12,100	1,331,000	10.4881	4.7914	.009090909	345.58	9,503.32
111	12,321	1,367,631	10.5357	4.8059	.009009009	348.72	9,676.89
112	12,544	1,404,928	10.5830	4.8203	.008928571	351.86	9,852.03
113	12,769	1,442,897	10.6301	4.8346	.008849558	355.00	10,028.75
114	12,996	1,481,544	10.6771	4.8488	.008771930	358.14	10,207.03
115	13,225	1,520,875	10.7238	4.8629	.008695652	361.28	10,386.89
116	13,456	1,560,896	10.7703	4.8770	.008620690	364.42	10,568.32
117	13,689	1,601,613	10.8167	4.8910	.008547009	367.57	10,751.32
118	13,924	1,643,032	10.8628	4.9049	.008474576	370.71	10,935.88

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
119	14,161	1,685,159	10.9087	4.9187	.008403361	373.85	11,122.02
120	14,400	1,728,000	10.9545	4.9324	.008333333	376.99	11,309.73
121	14,641	1,771,561	11.0000	4.9461	.008264463	380.13	11,499.01
122	14,884	1,815,848	11.0454	4.9597	.008196721	383.27	11,689.87
123	15,129	1,860,867	11.0905	4.9732	.008130081	386.42	11,882.29
124	15,376	1,906,624	11.1355	4.9866	.008064516	389.56	12,076.28
125	15,625	1,953,125	11.1803	5.0000	.008000000	392.70	12,271.85
126	15,876	2,000,376	11.2250	5.0133	.007936508	395.84	12,468.98
127	16,129	2,048,383	11.2694	5.0265	.007874016	398.98	12,667.69
128	16,384	2,097,152	11.3137	5.0397	.007812500	402.12	12,867.96
129	16,641	2,146,689	11.3578	5.0528	.007751938	405.27	13,069.81
130	16,900	2,197,000	11.4018	5.0658	.007692308	408.41	13,273.23
131	17,161	2,248,091	11.4455	5.0788	.007633588	411.55	13,478.22
132	17,424	2,299,968	11.4891	5.0916	.007575758	414.69	13,684.78
133	17,689	2,352,637	11.5326	5.1045	.007518797	417.83	13,892.91
134	17,956	2,406.104	11.5758	5.1172	.007462687	420.97	14,102.61
135	18,225	2,460,375	11.6190	5.1299	.007407407	421.12	14,313.88
136	18,496	2,515,456	11.6619	5.1426	.007352941	427.26	14,526.72
137	18,769	2,571,353	11.7047	5.1551	.007299270	430.40	14,741.14
138	19,044	2,628,072	11.7473	5.1676	.007246377	433.54	14,957.12
139	19,321	2,685,619	11.7898	5.1801	.007194245	436.68	15,174.68
140	19,600	2,744,000	11.8322	5.1925	.007142857	439.82	15,393.80
141	19,881	2,803,221	11.8743	5.2048	.007092199	442.96	15,614.50
142	20,164	2,863,288	11.9164	5.2171	.007042254	446.11	15,836.77
143	20,449	2,924,207	11.9583	5.2293	.006993007	449.25	16,060.61
144	20,736	2,985,984	12.0000	5.2415	.006944444	452.39	16,286.02
145	21,025	3,048,625	12.0416	5.2536	.006896552	455.53	16,513.00
146	21,316	3,112,136	12.0830	5.2656	.006849315	458.67	16,741.55
147	21,609	3,176,523	12.1244	5.2776	.006802721	461.81	16,971.67
148	21,904	3,241.792	12.1655	5.2896	.006756757	464.96	17,203.36
149	22.201	3,307,949	12.2066	5.3015	.006711409	468.10	17,436.62
150	22.500	3,375,000	12.2474	5.3133	.006666667	471.24	17,671.46
151	22,801	3,442,951	12.2882	5.3251	.006622517	474.38	17,907.86
152	23,104	3.511.808	12.3288	5.3368	.006578947	477.52	18,145.84
153	23,409	3,581,577	12.3693	5.3485	.006535948	480.66	18,385.39
154	23,716	3,652,264	12.4097	5.3601	.006493506	483.81	18,626.50
155	24,025	3,723,875	12.4499	5.3717	.006451613	486.95	18,869.19
156	24,336	3,796,416	12.4900	5.3832	.006410256	490.09	19,113.45
157	24,649	3,869,893	12.5300	5.3947	.006369427	493.23	19,359.28
158	24,964	3,944,312	12.5698	5.4061	.006329114	496.37	19,606.68
159	25,281	4,019,679	12.6095	5.4175	.006289308	499.51	19,855.65
160	25,600	4,096,000	12.6491	5.4288	.006250000	502.65	20,106.19
161	25,921	4,173,281	12.6886	5.4401	.006211180	505.80	20,358.31
162	26,244	4,251,528	12.7279	5.4514	.006172840	508.94	20,611.99
163	26,569	4,330,747	12.7671	5.4626	.006134969	512.08	20,867.24
164	26,896	4,410,944	12.8062	5.4737	.006097561	515.22	21,124.07
165	27,225	4,492,125	12.8452	5.4848	.006060606	518.36	21,382.46
166	27,556	4,574,296	12.8841	5.4959	.006024096	521.50	21,642.43
167	27,889	4,657,463	12.9228	5.5069	.005988024	524.65	21,903.97
168	28,224	4,741,632	12.9615	5.5178	.005952381	527.79	22,167.08
169	28,561	4,826,809	13.0000	5.5288	.005917160	530.93	22.431.76
170	28,900	4,913,000	13.0384	5.5397	.005882353	534.07	22,698.01
171	29,241	5,000,211	13.0767	5.5505	.005847953	537.21	22,965.83
172	29,584	5,088,448	13.1149	5.5613	.005813953	540.35	23,235.22
173	29,929	5,177,717	13.1529	5.5721	.005780347	543.50	23,506.18
174	30,276	5,268,024	13.1909	5.5828	.005747126	546.64	23,778.71
175	30,625	5,359,375	13.2288	5.5934	.005714286	549.78	24.052.82
176	30,976	5,451,776	13.2665	5.6041	.005681818	552.92	24,328.49
177	31,329	5,545,233	13.3041	5.6147	.005649718	556.06	24,605.74
178	31,684	5,639,752	13.3417	5.6252	.005617978	559.20	24,884.56
179	32.041	5,735,339	13.3791	5.6357	.005586592	562.35	25,164.94
180	32,400	5,832,000	13.4164	5.6462	.005555556	565.49	25,446.90
181	32,761	5,929,741	13.4536	5.6567	.005524862	568.63	25,730.48

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
182	33,124	6,028,568	13.4907	5.6671	.005494505	571.77	26,015.53
183	33,489	6,128,487	13.5277	5.6774	.005464481	574.91	26,302.20
184	33,856	6,229,504	13.5647	5.6877	.005434783	578.05	26,590.44
185	34,225	6,331,625	13.6015	5.6980	.005405405	581.19	26,880.25
186	34,596	6,434,856	13.6382	5.7083	.005376344	584.34	27,171.63
187	34,969	6,539,203	13.6748	5.7185	.005347594	587.48	27,464.59
188	35,344	6,644,672	13.7113	5.7287	.005319149	590.62	27,759.11
189	35,721	6,751,269	13.7477	5.7388	.005291005	593.76	28,055.21
190	36,100	6,859,000	13.7840	5.7489	.005263158	596.90	28,352.87
191	36,481	6,967,871	13.8203	5.7590	.005235602	600.04	28,652.11
192	36,864	7,077,888	13.8564	5.7690	.005208333	603.19	28,952.92
193	37,249	7,189,057	13.8924	5.7790	.005181347	606.33	29,255.30
194	37,636	7,301,384	13.9284	5.7890	.005154639	609.47	29,559.25
195	38,025	7,414,875	13.9642	5.7989	.005128205	612.61	29,864.77
196	38,416	7,529,536	14.0000	5.8088	.005102041	615.75	30,171.86
197	38,809	7,645,373	14.0357	5.8186	.005076142	618.89	30,480.52
198	39,204	7,762,392	14.0712	5.8285	.005050505	622.04	30,790.75
199	39,601	7,880,599	14.1067	5.8383	.005025126	625.18	31,102.55
200	40,000	8,000,000	14.1421	5.8480	.005000000	628.32	31,415.93
201	40,401	8,120,601	14.1774	5.8578	.004975124	631.46	31,730.87
202	40,804	8,242,408	14.2127	5.8675	.004950495	634.60	32,047.39
203	41,209	8,365,427	14.2478	5.8771	.004926108	637.74	32,365.47
204	41,616	8,489,664	14.2829	5.8868	.004901961	640.88	32,685.13
205	42,025	8,615,125	14.3178	5.8964	.004878049	644.03	33,006.36
206	42,436	8,741,816	14.3527	5.9059	.004854369	647.17	33,329.16
207	42,849	8,869,743	14.3875	5.9155	.004830918	650.31	33,653.53
208	43,264	8,998,912	14.4222	5.9250	.004807692	653.45	33,979.47
209	43,681	9,129,329	14.4568	5.9345	.004784689	656.59	34,306.98
210	44,100	9,261,000	14.4914	5.9439	.004761905	659.73	34,636.06
211	44,521	9,393,931	14.5258	5.9533	.004739336	662.88	34,966.71
212	44,944	9,528,128	14.5602	5.9627	.004716981	666.02	35,298.94
213	45,369	9,663,597	14.5945	5.9721	.004694836	669.16	35,632.73
214	45,796	9,800,344	14.6287	5.9814	.004672897	672.30	35,968.09
215	46,225	9,938,375	14.6629	5.9907	.004651163	675.44	36,305.03
216	46,656	10,077,696	14.6969	6.0000	.004629630	678.58	36,643.54
217	47,089	10,218,313	14.7309	6.0092	.004608295	681.73	36,983.61
218	47,524	10,360,232	14.7648	6.0185	.004587156	684.87	37,325.26
219	47,961	10,503,459	14.7986	6.0277	.004566210	688.01	37,668.48
220	48,400	10,648,000	14.8324	6.0368	.004545455	691.15	38,013.27
221	48.841	10,793,861	14.8661	6.0459	.004524887	694.29	38,359.63
222	49,284	10,941,048	14.8997	6.0550	.004504505	697.43	38,707.56
223	49,729	11,089,567	14.9332	6.0641	.004484305	700.58	39,057.07
224	50,176	11,239,424	14.9666	6.0732	.004464286	703.72	39,408.14
225	50,625	11,390,625	15.0000	6.0822	.004444444	706.86	39,760.78
226	51,076	11,543,176	15.0333	6.0912	.004424779	710.00	40,115.00
227	51,529	11,697,083	15.0665	6.1002	.004405286	713.14	40,470.78
228	51,984	11,852,352	15.0997	6.1091	.004385965	716.28	40,828.14
229	52,441	12,008,989	15.1327	6.1180	.004366812	719.42	41,187.07
230	52,900	12,167,000	15.1658	6.1269	.004347826	722.57	41,547.56
231	53,361	12,326,391	15.1987	6.1358	.004329004	725.71	41,909.63
232	53,824	12,487,168	15.2315	6.1446	.004310345	728.85	42,273.27
233	54.289	12,649,337	15.2643	6.1534	.004291845	731.99	42,638.48
234	54,756	12,812,904	15.2971	6.1622	.004273504	735.13	43,005.26
235	55.225	12,977,875	15.3297	6.1710	.004255319	738.27	43,373.61
236	55,696	13,144.256	15.3623	6.1797	.004237288	741.42	43,743.54
237	56,169	13,312,053	15.3948	6.1885	.004219409	744.56	44,115.03
238	56,644	13,481,272	15.4272	6.1972	.004201681	747.70	44,488.09
239	57,121	13,651,919	15.4596	6.2058	.004184100	750.84	44,862.73
240	57,600	13,824,000	15.4919	6.2145	.004166667	753.98	45,238.93
241	58,081	13,997,521	15.5242	6.2231	.004149378	757.12	45,616.71
242	58,564	14,172,488	15.5563	6.2317	.004132231	760.27	45,996.06
243	59.049	14,348,907	15.5885	6.2403	.004115226	763.41	46,376.98
244	59,536	14,526,784	15.6205	6.2488	.004098361	766.55	46,759.47

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
245	60,025	14,706,125	15.6525	6.2573	.004081633	769.69	47,143.52
246	60,516	14,886,936	15.6844	6.2658	.004065041	772.83	47,529.16
247	61,009	15,069,223	15.7162	6.2743	.004048583	775.97	47,916.36
248	61,504	15,252,992	15.7480	6.2828	.004032258	779.11	48,305.13
249	62,001	15,438,249	15.7797	6.2912	.004016064	782.26	48,695.47
250	62,500	15,625,000	15.8114	6.2996	.004000000	785.40	49,087.39
251	63,001	15,813,251	15.8430	6.3080	.003984064	788.54	49,480.87
252	63,504	16,003,008	15.8745	6.3164	.003968254	791.68	49,875.92
253	64,009	16,194,277	15.9060	6.3247	.003952569	794.82	50,272.55
254	64,516	16,387,064	15.9374	6.3330	.003937008	797.96	50,670.75
255	65,025	16,581,375	15.9687	6.3413	.003921569	801.11	51,070.52
256	65,536	16,777,216	16.0000	6.3496	.003906250	804.25	51,471.85
257	66,049	16,974,593	16.0312	6.3579	.003891051	807.39	51,874.76
258	66,564	17,173,512	16.0624	6.3661	.003875969	810.53	52,279.24
259	67,081	17,373,979	16.0935	6.3743	.003861004	813.67	52,685.29
260	67,600	17,576,000	16.1245	6.3825	.003846154	816.81	53,092.92
261	68,121	17,779,581	16.1555	6.3907	.003831418	819.96	53,502.11
262	68,644	17,984,728	16.1864	6.3988	.003816794	823.10	53,912.87
263	69,169	18,191,447	16.2173	6.4070	.003802281	826.24	54,325.21
264	69,696	18,399,744	16.2481	6.4151	.003787879	829.38	54,739.11
265	70,225	18,609,625	16.2788	6.4232	.003773585	832.52	55,154.59
266	70,756	18,821,096	16.3095	6.4312	.003759398	835.66	55,571.63
267	71,289	19,034,163	16.3401	6.4393	.003745318	838.81	55,990.25
268	71,824	19,248,832	16.3707	6.4473	.003731343	841.95	56,410.44
269	72,361	19,465,109	16.4012	6.4553	.003717472	845.09	56,832.20
270	72,900	19,683,000	16.4317	6.4633	.003703704	848.23	57,255.53
271	73,441	19,902,511	16.4621	6.4713	.003690037	851.37	57,680.43
272	73,984	20,123,648	16.4924	6.4792	.003676471	854.51	58,106.90
273	74,529	20,346,417	16.5227	6.4872	.003663004	857.65	58,534.94
274	75,076	20,570,824	16.5529	6.4951	.003649635	860.80	58,964.55
275	75,625	20,796,875	16.5831	6.5030	.003636364	863.94	59,395.74
276	76,176	21,024,576	16.6132	6.5108	.003623188	867.08	59,828.49
277	76,729	21,253,933	16.6433	6.5187	.003610108	870.22	60,262.82
278	77,284	21,484,952	16.6733	6.5265	.003597122	873.36	60,698.71
279	77,841	21,717,639	16 7033	6.5343	.003584229	876.50	61,136.18
280	78,400	21,952,000	16.7332	6.5421	.003571429	879.65	61,575.22
281	78,961	22,188,041	16.7631	6.5499	.003558719	882.79	62,015.82
282	79,524	22,425,768	16.7929	6.5577	.003546099	885.93	62,458.00
283	80,089	22,665,187	16.8226	6.5654	.003533569	889.07	62,901.75
284	80,656	22,906,304	16.8523	6.5731	.003521127	892.21	63,347.07
285	81,225	23,149,125	16.8819	6.5808	.003508772	895.35	63,793.97
286	81,796	23,393,656	16.9115	6.5885	.003496503	898.50	64,242.43
287	82,369	23,639,903	16.9411	6.5962	.003484321	901.64	64,692.46
288	82,944	23,887,872	16.9706	6.6039	.003472222	904.78	65,144.07
289	83,521	24,137,569	17.0000	6.6115	.003460208	907.92	65,597.24
290	84,100	24,389,000	17.0294	6.6191	.003448276	911.06	66,051.99
291	84,681	24,642,171	17.0587	6.6267	.003436426	914.20	66,508.30
292	85,264	24,897,088	17.0880	6.6343	.003424658	917.35	66,966.19
293	85,849	25,153,757	17.1172	6.6419	.003412969	920.49	67,425.65
294	86,436	25,412,184	17.1464	6.6494	.003401361	923.63	67,886.68
295	87,025	25,672,375	17.1756	6.6569	.003389831	926.77	68,349.28
296	87,616	25,934,336	17.2047	6.6644	.003378378	929.91	68,813.45
297	88,209	26,198,073	17.2337	6.6719	.003367003	933.05	69,279.19
298	88,804	26,463,592	17.2627	6.6794	.003355705	936.19	69,746.50
299	89,401	26,730,899	17.2916	6.6869	.003344482	939.34	70,215.38
300	90,000	27,000,000	17.3205	6.6943	.003333333	942.48	70,685.83
301	90,601	27,270,901	17.3494	6.7018	.003322259	945.62	71,157.86
302	91,204	27,543,608	17.3781	6.7092	.003311258	948.76	71,631.45
303	91,809	27,818,127	17.4069	6.7166	.003300330	951.90	72,106.62
304	92,416	28,094,464	17.4356	6.7240	.003289474	955.04	72,583.36
305	93,025	28,372,625	17.4642	6.7313	.003278689	958.19	73,061.66
306	93,636	28,652,616	17.4929	6.7387	.003267974	961.33	73,541.54
307	94,249	28,934,443	17.5214	6.7460	.003257329	964.47	74,022.99

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
308	94,864	29,218,112	17.5499	6.7533	.003246753	967.61	74,506.01
309	95,481	29,503,629	17.5784	6.7606	.003236246	970.75	74,990.60
310	96,100	29,791,000	17.6068	6.7679	.003225806	973.89	75,476.76
311	96,721	30,080,231	17.6352	6.7752	.003215434	977.04	75,964.50
312	97,344	30,371,328	17.6635	6.7824	.003205128	980.18	76,453.80
313	97,969	30,664,297	17.6918	6.7897	.003194888	983.32	76,944.67
314	98,596	30,959,144	17.7200	6.7969	.003184713	986.46	77,437.12
315	99,225	31,255,875	17.7482	6.8041	.003174603	989.60	77,931.13
316	99,856	31,554,496	17.7764	6.8113	.003164557	992.74	78,426.72
317	100,489	31,855,013	17.8045	6.8185	.003154574	995.88	78,923.88
318	101,124	32,157,432	17.8326	6.8256	.003144654	999.03	79,422.60
319	101,761	32,461,759	17.8606	6.8328	.003134796	1,002.17	79,922.90
320	102,400	32,768,000	17.8885	6.8399	.003125000	1,005.31	80,424.77
321	103,041	33,076,161	17.9165	6.8470	.003115265	1,008.45	80,928.21
322	103,684	33,386,248	17.9444	6.8541	.003105590	1,011.59	81,433.22
323	104,329	33,698,267	17.9722	6.8612	.003095975	1,014.73	81,939.80
324	104,976	34,012,224	18.0000	6.8683	.003086420	1,017.88	82,447.96
325	105,625	34,328,125	18.0278	6.8753	.003076923	1,021.02	82,957.68
326	106,276	34,645,976	18.0555	6.8824	.003067485	1,024.16	83,468.98
327	106,929	34,965,783	18.0831	6.8894	.003058104	1,027.30	83,981.84
328	107,584	35,287,552	18.1108	6.8964	.003048780	1,030.44	84,496.28
329	108,241	35,611,289	18.1384	6.9034	.003039514	1,033.58	85,012.28
330	108,900	35,937,000	18.1659	6.9104	.003030303	1,036.73	85,529.86
331	109,561	36,264,691	18.1934	6.9174	.003021148	1,039.87	86,049.01
332	110,224	36,594,368	18.2209	6.9244	.003012048	1,043.01	86,569.73
333	110,889	36,926,037	18.2483	6.9313	.003003003	1,046.15	87,092.02
334	111,556	37,259,704	18.2757	6.9382	.002994012	1,049.29	87,615.88
335	112,225	37,595,375	18.3030	6.9451	.002985075	1,052.43	88,141.31
336	112,896	37,933,056	18.3303	6.9521	.002976190	1,055.58	88,668.31
337	113,569	38,272,753	18.3576	6.9589	.002967359	1,058.72	89,196.88
338	114,244	38,614,472	18.3848	6.9658	.002958580	1,061.86	89,727.03
339	114,921	38,958,219	18.4120	6.9727	.002949853	1,065.00	90,258.74
340	115,600	39,304,000	18.4391	6 9795	.002941176	1,068.14	90,792.03
341	116,281	39,651,821	18.4662	6.9864	.002932551	1,071.28	91,326.88
342	116,964	40,001,688	18.4932	6.9932	.002923977	1,074.42	91,863.31
343	117,649	40,353,607	18.5203	7.0000	.002915452	1,077.57	92,401.31
344	118,336	40,707,584	18.5472	7.0068	.002906977	1,080.71	92,940.88
345	119,025	41,063,625	18.5742	7.0136	.002898551	1,083.85	93,482.02
346	119,716	41,421,736	18.6011	7.0203	.002890173	1,086.99	94,024.73
347	120,409	41 781,923	18.6279	7.0271	.002881844	1,090.13	94,569.01
348	121,104	42,144,192	18.6548	7.0338	.002873563	1,093.27	95,114.86
349	121,801	42,508,549	18.6815	7.0406	.002865330	1,096.42	95,662.28
350	122,500	42,875,000	18.7083	7.0473	.002857143	1,099.56	96,211.28
351	123,201	43,243,551	18.7350	7.0540	.002849003	1,102.70	96,761.84
352	123,904	43,614,208	18.7617	7.0607	.002840909	1,105.84	97,313.97
353	124,609	43,986,977	18.7883	7.0674	.002832861	1,108.98	97,867.68
354	125,316	44,361,864	18.8149	7.0740	.002824859	1,112.12	98,422.96
355	126,025	44,738,875	18.8414	7.0807	.002816901	1,115.27	98,979.80
356	126,736	45,118,016	18.8680	7.0873	.002808989	1,118.41	99,538.22
357	127,449	45,499,293	18.8944	7.0940	.002801120	1,121.55	100,098.21
358	128,164	45,882,712	18.9209	7.1006	.002793296	1,124.69	100,659.77
359	128,881	46,268,279	18.9473	7.1072	.002785515	1,127.83	101,222.90
360	129,600	46,656,000	18.9737	7.1138	.002777778	1,130.97	101,787.60
361	130,321	47,045,881	19.0000	7.1204	.002770083	1,134.11	102,353.87
362	131,044	47,437,928	19.0263	7.1269	.002762431	1,137.26	102,921.72
363	131,769	47,832,147	19.0526	7.1335	.002754821	1,140.40	103,491.13
364	132,496	48,228,544	19.0788	7.1400	.002747253	1,143.54	104,062.12
365	133,225	48,627,125	19.1050	7.1466	.002739726	1,146.68	104,634.67
366	133,956	49,027,896	19.1311	7.1531	.002732240	1,149.82	105,208.80
367	134,689	49,430,863	19.1572	7.1596	.002724796	1,152.96	105,784.49
368	135,424	49,836,032	19.1833	7.1661	.002717391	1,156.11	106,361.76
369	136,161	50,243,409	19.2094	7.1726	.002710027	1,159.25	106,940.60
370	136,900	50,653,000	19.2354	7.1791	.00270270 3	1,162.39	107,521.01

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
371	137,641	51,064,811	19.2614	7.1855	.002695418	1,165.53	108,102.99
372	138,384	51,478,848	19.2873	7.1920	.002688172	1,168.67	108,686.54
373	139,129	51,895,117	19.3132	7.1984	.002680965	1,171.81	109,271.66
374	139,876	52,313,624	19.3391	7.2048	.002673797	1,174.96	109,858.35
375	140,625	52,734,375	19.3649	7.2112	.002666667	1,178.10	110,446.62
376	141,376	53,157,376	19.3907	7.2177	.002659574	1,181.24	111,036.45
377	142,129	53,582,633	19.4165	7.2240	.002652520	1,184.38	111,627.86
378	142,884	54,010,152	19.4422	7.2304	.002645503	1,187.52	112,220.83
379	143,641	54,439,939	19.4679	7.2368	.002638522	1,190.66	112,815.38
380	144,400	54,872,000	19.4936	7.2432	.002631579	1,193.81	113,411.49
381	145,161	55,306,341	19.5192	7.2495	.002624672	1,196.95	114,009.18
382	145,924	55,742,968	19.5448	7.2558	.002617801	1,200.09	114,608.44
383	146,689	56,181,887	19.5704	7.2622	.002610966	1,203.23	115,209.27
384	147,456	56,623,104	19.5959	7.2685	.002604167	1,206.37	115,811.67
385	148,225	57,066,625	19.6214	7.2748	.002597403	1,209.51	116,415.64
386	148,996	57,512,456	19.6469	7.2811	.002590674	1,212.65	117,021.18
387	149,769	57,960,603	19.6723	7.2874	.002583979	1,215.80	117,628.30
388	150,544	58,411,072	19.6977	7.2936	.002577320	1,218.94	118,236.98
389	151,321	58,863,869	19.7231	7.2999	.002570694	1,222.08	118,847.24
390	152,100	59,319,000	19.7484	7.3061	.002564103	1,225.22	119,459.06
391	152,881	59,776,471	19.7737	7.3124	.002557545	1,228.36	120,072.46
392	153,664	60,236,288	19.7990	7.3186	.002551020	1,231.50	120,687.42
393	154,449	60,698,457	19.8242	7.3248	.002544529	1,234.65	121,303.96
394	155,236	61,162,984	19.8494	7.3310	.002538071	1,237.79	121,922.07
395	156,025	61,629,875	19.8746	7.3372	.002531646	1,240.93	122,541.75
396	156,816	62,099,136	19.8997	7.3434	.002525253	1,244.07	123,163.00
397	157,609	62,570,773	19.9249	7.3496	.002518892	1,247.21	123,785.82
398	158,404	63,044,792	19.9499	7.3558	.002512563	1,250.35	124,410.21
399	159,201	63,521,199	19.9750	7.3619	.002506266	1,253.50	125,036.17
400	160,000	64,000,000	20.0000	7.3681	.002500000	1,256.64	125,663.71
401	160,801	64,481,201	20.0250	7.3742	.002493766	1,259.78	126,292.81
402	161,604	64,964,808	20.0499	7.3803	.002487562	1,262.92	126,923.48
403	162,409	65,450,827	20.0749	7.3864	.002481390	1,266.06	127,555.73
404	163,216	65,939,264	20.0998	7.3925	.002475248	1,269.20	128,189.55
405	164,025	66,430,125	20.1246	7.3986	.002469136	1,272.35	128,824.93
406	164,836	66,923,416	20.1494	7.4047	.002463054	1,275.49	129,461.89
407	165,649	67,419,143	20.1742	7.4108	.002457002	1,278.63	130,100.42
408	166,464	67,917,312	20.1990	7.4169	.002450980	1,281.77	130,740.52
409	167,281	68,417,929	20.2237	7.4229	.002444988	1,284.91	131,382.19
410	168,100	68,921,000	20.2485	7.4290	.002439024	1,288.05	132,025.43
411	168,921	69,426,531	20.2731	7.4350	.002433090	1,291.19	132,670.24
412	169,744	69,934,528	20.2978	7.4410	.002427184	1,294.34	133,316.63
413	170,569	70,444,997	20.3224	7.4470	.002421308	1,297.48	133,964.58
414	171,396	70,957,944	20.3470	7.4530	.002415459	1,300.62	134,614.10
415	172,225	71,473,375	20.3715	7.4590	.002409639	1,303.76	135,265.20
416	173,056	71,991,296	20.3961	7.4650	.002403846	1,306.90	135,917.86
417	173,889	72,511,713	20.4206	7.4710	.002398082	1,310.04	136,572.10
418	174,724	73,034,632	20.4450	7.4770	.002392344	1,313.19	137,227.91
419	175,561	73,560,059	20.4695	7.4829	.002386635	1,316.33	137,885.29
420	176,400	74,088,000	20.4939	7.4889	.002380952	1,319.47	138,544.24
421	177,241	74,618,461	20.5183	7.4948	.002375297	1,322.61	139,204.76
422	178,084	75,151,448	20.5426	7.5007	.002369668	1,325.75	139,866.85
423	178,929	75,686,967	20.5670	7.5067	.002364066	1,328.89	140,530.51
424	179,776	76,225,024	20.5913	7.5126	.002358491	1,332.04	141,195.74
425	180,625	76,765,625	20.6155	7.5185	.002352941	1,335.18	141,862.54
426	181,476	77,308,776	20.6398	7.5244	.002347418	1,338.32	142,530.92
427	182,329	77,854,483	20.6640	7.5302	.002341920	1,341.46	143,200.86
428	183,184	78,402,752	20.6882	7.5361	.002336449	1,344.60	143,872.38
429	184,041	78,953,589	20.7123	7.5420	.002331002	1,347.74	144,545.46
430	184,900	79,507,000	20.7364	7.5478	.002325581	1,350.88	145,220.12
431	185,761	80,062,991	20.7605	7.5537	.002320186	1,354.03	145,896.35
432	186,624	80,621,568	20.7846	7.5595	.002314815	1,357.17	146,574.15
433	187,489	81,182,737	20.8087	7.5654	.002309469	1,360.31	147,253.52

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
434	188,356	81,746,504	20.8327	7.5712	.002304147	1,363.45	147,934.46
435	189,225	82,312,875	20.8567	7.5770	.002298851	1,366.59	148,616.97
436	190,096	82,881,856	20.8806	7.5828	.002293578	1,369.73	149,301.05
437	190,969	83,453,453	20.9045	7.5886	.002288330	1,372.88	149,986.70
438	191,844	84,027,672	20.9284	7.5944	.002283105	1,376.02	150,673.93
439	192,721	84,604,519	20.9523	7.6001	.002277904	1,379.16	151,362.72
440	193,600	85,184,000	20.9762	7.6059	.002272727	1,382.30	152,053.08
441	194,481	85,766,121	21.0000	7.6117	.002267574	1,385.44	152,745.02
442	195,364	86,350,888	21.0238	7.6174	.002262443	1,388.58	153,438.53
443	196,249	86,938,307	21.0476	7.6232	.002257336	1,391.73	154,133.60
444	197,136	87,528,384	21.0713	7.6289	.002252252	1,394.87	154,830.25
445	198,025	88,121,125	21.0950	7.6346	.002247191	1,398.01	155,528.47
446	198,916	88,716,536	21.1187	7.6403	.002242152	1,401.15	156,228.26
447	199,809	89,314,623	21.1424	7.6460	.002237136	1,404.29	156,929.62
448	200,704	89,915,392	21.1660	7.6517	.002232143	1,407.43	157,632.55
449	201,601	90,518,849	21.1896	7.6574	.002227171	1,410.58	158,337.06
450	202,500	91,125,000	21.2132	7.6631	.002222222	1,413.72	159,043.13
451	203,401	91,733,851	21.2368	7.6688	.002217295	1,416.86	159,750.77
452	204,304	92,345,408	21.2603	7.6744	.002212389	1,420.00	160,459.99
453	205,209	92,959,677	21.2838	7.6801	.002207506	1,423.14	161,170.77
454	206,116	93,576,664	21.3073	7.6857	.002202643	1,426.28	161,883.13
455	207,025	94,196,375	21.3307	7.6914	.002197802	1,429.42	162,597.05
456	207,936	94,818,816	21.3542	7.6970	.002192982	1,432.57	163,312.55
457	208,849	95,443,993	21.3776	7.7026	.002188184	1,435.71	164,029.62
458	209,764	96,071,912	21.4009	7.7082	.002183406	1,438.85	164,748.26
459	210,681	96,702,579	21.4243	7.7138	.002178649	1,441.99	165,468.47
460	211,600	97,336,000	21.4476	7.7194	.002173913	1,445.13	166,190.25
461	212,521	97,972,181	21.4709	7.7250	.002169197	1,448.27	166,913.60
462	213,444	98,611,128	21.4942	7.7306	.002164502	1,451.42	167,638.53
463	214,369	99,252,847	21.5174	7.7362	.002159827	1,454.56	168,365.02
464	215,296	99,897,344	21.5407	7.7418	.002155172	1,457.70	169,093.08
465	216,225	100,544,625	21.5639	7.7473	.002150538	1,460.84	169,822.72
466	217,156	101,194,696	21.5870	7.7529	.002145923	1,463.98	170,553.92
467	218,089	101,847,563	21.6102	7.7584	.002141328	1,467.12	171,286.70
468	219,024	102,503,232	21.6333	7.7639	.002136752	1,470.27	172,021.05
469	219,961	103,161,709	21.6564	7.7695	.002132196	1,473.41	172,756.97
470	220,900	103,823,000	21.6795	7.7750	.002127660	1,476.55	173,494.45
471	221,841	104,487,111	21.7025	7.7805	.002123142	1,479.69	174,233.51
472	222,784	105,154,048	21.7256	7.7860	.002118644	1,482.83	174,974.14
473	223,729	105,823,817	21.7486	7.7915	.002114165	1,485.97	175,716.35
474	224,676	106,496,424	21.7715	7.7970	.002109705	1,489.11	176,460.12
475	225,625	107,171,875	21.7945	7.8025	.002105263	1,492.26	177,205.46
476	226,576	107,850,176	21.8174	7.8079	.002100840	1,495.40	177,952.37
477	227,529	108,531,333	21.8403	7.8134	.002096436	1,498.54	178,700.86
478	228,484	109,215,352	21.8632	7.8188	.002092050	1,501.68	179,450.91
479	229,441	109,902,239	21.8861	7.8243	.002087683	1,504.82	180,202.54
480	230,400	110,592,000	21.9089	7.8297	.002083333	1,507.96	180,955.74
481	231,361	111,284,641	21.9317	7.8352	.002079002	1,511.11	181,710.50
482	232,324	111,980,168	21.9545	7.8406	.002074689	1,514.25	182,466.84
483	233,289	112,678,587	21.9773	7.8460	.002070393	1,517.39	183,224.75
484	234,256	113,379,904	22.0000	7.8514	.002066116	1,520.53	183,984.23
485	235,225	114,084,125	22.0227	7.8568	.002061856	1,523.67	184,745.28
486	236,196	114,791,256	22.0454	7.8622	.002057613	1,526.81	185,507.90
487	237,169	115,501,303	22.0681	7.8676	.002053388	1,529.96	186,272.10
488	238,144	116,214,272	22.0907	7.8730	.002049180	1,533.10	187,037.86
489	239,121	116,930,169	22.1133	7.8784	.002044990	1,536.24	187,805.19
490	240,100	117,649,000	22.1359	7.8837	.002040816	1,539.38	188,574.10
491	241,081	118,370,771	22.1585	7.8891	.002036660	1,542.52	189,344.57
492	242,064	119,095,488	22.1811	7.8944	.002032520	1,545.66	190,116.62
493	243,049	119,823,157	22.2036	7.8998	.002028398	1,548.81	190,890.24
494	244,036	120,553,784	22.2261	7.9051	.002024291	1,551.95	191,665.43
495	245,025	121,287,375	22.2486	7.9105	.002020202	1,555.09	192,442.18
496	246,016	122,023,936	22.2711	7.9158	.002016129	1,558.23	193,220.51

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
497	247,009	122,763,473	22.2935	7.9211	.002012072	1,561.37	194,000.41
498	248,004	123,505,992	22.3159	7.9264	.002008032	1,564.51	194,781.89
499	249,001	124,251,499	22.3383	7.9317	.002004008	1,567.65	195,564.93
500	250,000	125,000,000	22.3607	7.9370	.002000000	1,570.80	196,349.54
501	251,001	125,751,501	22.3830	7.9423	.001996008	1,573.94	197,135.72
502	252,004	126,506,008	22.4054	7.9476	.001992032	1,577.08	197,923.48
503	253,009	127,263,527	22.4277	7.9528	.001988072	1,580.22	198,712.80
504	254,016	128,024,064	22.4499	7.9581	.001984127	1,583.36	199,503.70
505	255,025	128,787,625	22.4722	7.9634	.001980198	1,586.50	200,296.17
506	256,036	129,554,216	22.4944	7.9686	.001976285	1,589.65	201,090.20
507	257,049	130,323,843	22.5167	7.9739	.001972387	1,592.79	201,885.81
508	258,064	131,096,512	22.5389	7.9791	.001968504	1,595.93	202,682.99
509	259,081	131,872,229	22.5610	7.9843	.001964637	1,599.07	203,481.74
510	260,100	132,651,000	22.5832	7.9896	.001960784	1,602.21	204,282.06
511	261,121	133,432,831	22.6053	7.9948	.001956947	1,605.35	205,083.95
512	262,144	134,217,728	22.6274	8.0000	.001953125	1,608.50	205,887.42
513	263,169	135,005,697	22.6495	8.0052	.001949318	1,611.64	206,692.45
514	264,196	135,796,744	22.6716	8.0104	.001945525	1,614.78	207,499.05
515	265,225	136,590,875	22.6936	8.0156	.001941748	1,617.92	208,307.23
516	266,256	137,388,096	22.7156	8.0208	.001937984	1,621.06	209,116.97
517	267,289	138,188,413	22.7376	8.0260	.001934236	1,624.20	209,928.29
518	268,324	138,991,832	22.7596	8.0311	.001930502	1,627.34	210,741.18
519	269,361	139,798,359	22.7816	8.0363	.001926782	1,630.49	211,555.63
520	270,400	140,608,000	22.8035	8.0415	.001923077	1,633.63	212,371.66
521	271,441	141,420,761	22.8254	8.0466	.001919386	1,636.77	213,189.26
522	272,484	142,236,648	22.8473	8.0517	.001915709	1,639.91	214,008.43
523	273,529	143,055,667	22.8692	8.0569	.001912046	1,643.05	214,829.17
524	274,576	143,877,824	22.8910	8.0620	.001908397	1,646.19	215,651.49
525	275,625	144,703,125	22.9129	8.0671	.001904762	1,649.34	216,475.37
526	276,676	145,531,576	22.9347	8.0723	.001901141	1,652.48	217,300.82
527	277,729	146,363,183	22.9565	8.0774	.001897533	1,655.62	218,127.85
528	278,784	147,197,952	22.9783	8.0825	.001893939	1,658.76	218,956.44
529	279,841	148,035,889	23.0000	8.0876	.001890359	1,661.90	219,786.61
530	280,900	148,877,000	23.0217	8.0927	.001886792	1,665.04	220,618.34
531	281,961	149,721,291	23.0434	8.0978	.001883239	1,668.19	221,451.65
532	283,024	150,568,768	23.0651	8.1028	.001879699	1,671.33	222,286.53
533	284,089	151,419,437	23.0868	8.1079	.001876173	1,674.47	223,122.98
534	285,156	152,273,304	23.1084	8.1130	.001872659	1,677.61	223,961.00
535	286,225	153,130,375	23.1301	8.1180	.001869159	1,680.75	224,800.59
536	287,296	153,990,656	23.1517	8.1231	.001865672	1,683.89	225,641.75
537	288,369	154,854,153	23.1733	8.1281	.001862197	1,687.04	226,484.48
538	289,444	155,720,872	23.1948	8.1332	.001858736	1,690.18	227,328.79
539	290,521	156,590,819	23.2164	8.1382	.001855288	1,693.32	228,174.66
540	291,600	157,464,000	23.2379	8.1433	.001851852	1,696.46	229,022.10
541	292,681	158,340,421	23.2594	8.1483	.001848429	1,699.60	229,871.12
542	293,764	159,220,088	23.2809	8.1533	.001845018	1,702.74	230,721.71
543	294,849	160,103,007	23.3024	8.1583	.001841621	1,705.88	231,573.86
544	295,936	160,989,184	23.3238	8.1633	.001838235	1,709.03	232,427.59
545	297,025	161,878,625	23.3452	8.1683	.001834862	1,712.17	233,282.89
546	298,116	162,771,336	23.3666	8.1733	.001831502	1,715.31	234,139.76
547	299,209	163,667,323	23.3880	8.1783	.001828154	1,718.45	234,998.20
548	300,304	164,566,592	23.4094	8.1833	.001824818	1,721.59	235,858.21
549	301,401	165,469,149	23.4307	8.1882	.001821494	1,724.73	236,719.79
550	302,500	166,375,000	23.4521	8.1932	.001818182	1,727.88	237,582.94
551	303,601	167,284,151	23.4734	8.1982	.001814882	1,731.02	238,447.67
552	304,704	168,196,608	23.4947	8.2031	.001811594	1,734.16	239,313.96
553	305,809	169,112,377	23.5160	8.2081	.001808318	1,737.30	240,181.83
554	306,916	170,031,464	23.5372	8.2130	.001805054	1,740.44	241,051.26
555	308,025	170,953,875	23.5584	8.2180	.001801802	1,743.58	241,922.27
556	309,136	171,879,616	23.5797	8.2229	.001798561	1,746.73	242,794.85
557	310,249	172,808,693	23.6008	8.2278	.001795332	1,749.87	243,668.99
558	311,364	173,741,112	23.6220	8.2327	.001792115	1,753.01	244,544.71
559	312,481	174,676,879	23.6432	8.2377	.001788909	1,756.15	245,422.00

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
560	313,600	175,616,000	23.6643	8.2426	.001785714	1,759.29	246,300.86
561	314,721	176,558,481	23.6854	8.2475	.001782531	1,762.43	247,181.30
562	315,844	177,504,328	23.7065	8.2524	.001779359	1,765.58	248,063.30
563	316,969	178,453,547	23.7276	8.2573	.001776199	1,768.72	248,946.87
564	318,096	179,406,144	23.7487	8.2621	.001773050	1,771.86	249,832.01
565	319,225	180,362,125	23.7697	8.2670	.001769912	1,775.00	250,718.73
566	320,356	181,321,496	23.7908	8.2719	.001766784	1,778.14	251,607.01
567	321,489	182,284,263	23.8118	8.2768	.001763668	1,781.28	252,496.87
568	322,624	183,250,432	23.8328	8.2816	.001760563	1,784.42	253,388.30
569	323,761	184,220,009	23.8537	8.2865	.001757469	1,787.57	254,281.29
570	324,900	185,193,000	23.8747	8.2913	.001754386	1,790.71	255,175.86
571	326,041	186,169,411	23.8956	8.2962	.001751313	1,793.85	256,072.00
572	327,184	187,149,248	23.9165	8.3010	.001748252	1,796.99	256,969.71
573	328,329	188,132,517	23.9374	8.3059	.001745201	1,800.13	257,868.99
574	329,476	189,119,224	23.9583	8.3107	.001742160	1,803.27	258,769.85
575	330,625	190,109,375	23.9792	8.3155	.001739130	1,806.42	259,672.27
576	331,776	191,102,976	24.0000	8.3203	.001736111	1,809.56	260,576.26
577	332,929	192,100,033	24.0208	8.3251	.001733102	1,812.70	261,481.83
578	334,084	193,100,552	24.0416	8.3300	.001730104	1,815.84	262,388.96
579	335,241	194,104,539	24.0624	8.3348	.001727116	1,818.98	263,297.67
580	336,400	195,112,000	24.0832	8.3396	.001724138	1,822.12	264,207.94
581	337,561	196,122,941	24.1039	8.3443	.001721170	1,825.27	265,119.79
582	338,724	197,137,368	24.1247	8.3491	.001718213	1,828.41	266,033.21
583	339,889	198,155,287	24.1454	8.3539	.001715266	1,831.55	266,948.20
584	341,056	199,176,704	24.1661	8.3587	.001712329	1,834.69	267,864.76
585	342,225	200,201,625	24.1868	8.3634	.001709402	1,837.83	268,782.89
586	343,396	201,230,056	24.2074	8.3682	.001706485	1,840.97	269,702.59
587	344,569	202,262,003	24.2281	8.3730	.001703578	1,844.11	270,623.86
588	345,744	203,297,472	24.2487	8.3777	.001700680	1,847.26	271,546.70
589	346,921	204,336,469	24.2693	8.3825	.001697793	1,850.40	272,471.12
590	348,100	205,379,000	24.2899	8.3872	.001694915	1,853.54	273,397.10
591	349,281	206,425,071	24.3105	8.3919	.001692047	1,856.68	274,324.66
592	350,464	207,474,688	24.3311	8.3967	.001689189	1,859.82	275,253.78
593	351,649	208,527,857	24.3516	8.4014	.001686341	1,862.96	276,184.48
594	352,836	209,584,584	24.3721	8.4061	.001683502	1,866.11	277,116.75
595	354,025	210,644,875	24.3926	8.4108	.001680672	1,869.25	278,050.58
596	355,216	211,708,736	24.4131	8.4155	.001677852	1,872.39	278,985.99
597	356,409	212,776,173	24.4336	8.4202	.001675042	1,875.53	279,922.97
598	357,604	213,847,192	24.4540	8.4249	.001672241	1,878.67	280,861.52
599	358,801	214,921,799	24.4745	8.4296	.001669449	1,881.81	281,801.65
600	360,000	216,000,000	24.4949	8.4343	.001666667	1,884.96	282,743.34
601	361,201	217,081,801	24.5153	8.4390	.001663894	1,888.10	283,686.60
602	362,404	218,167,208	24.5357	8.4437	.001661130	1,891.24	284,631.44
603	363,609	219,256,227	24.5561	8.4484	.001658375	1,894.38	285,577.84
604	364,816	220,348,864	24.5764	8.4530	.001655629	1,897.52	286,525.82
605	366,025	221,445,125	24.5968	8.4577	.001652893	1,900.66	287,475.36
606	367,236	222,545,016	24.6171	8.4623	.001650165	1,903.81	288,426.48
607	368,449	223,648,543	24.6374	8.4670	.001647446	1,906.95	289,379.17
608	369,664	224,755,712	24.6577	8.4716	.001644737	1,910.09	290,333.43
609	370,881	225,866,529	24.6779	8.4763	.001642036	1,913.23	291,289.26
610	372,100	226,981,000	24.6982	8.4809	.001639344	1,916.37	292,246.66
611	373,321	228,099,131	24.7184	8.4856	.001636661	1,919.51	293,205.63
612	374,544	229,220,928	24.7386	8.4902	.001633987	1,922.65	294,166.17
613	375,769	230,346,397	24.7588	8.4948	.001631321	1,925.80	295,128.28
614	376,996	231,475,544	24.7790	8.4994	.001628664	1,928.94	296,091.97
615	378,225	232,608,375	24.7992	8.5040	.001626016	1,932.08	297,057.22
616	379,456	233,744,896	24.8193	8.5086	.001623377	1,935.22	298,024.05
617	380,689	234,885,113	24.8395	8.5132	.001620746	1,938.36	298,992.44
618	381,924	236,029,032	24.8596	8.5178	.001618123	1,941.50	299,962.41
619	383,161	237,176,659	24.8797	8.5224	.001615509	1,944.65	300,933.95
620	384,400	238,328,000	24.8998	8.5270	.001612903	1,947.79	301,907.05
621	385,641	239,483,061	24.9199	8.5316	.001610306	1,950.93	302,881.73
622	386,884	240,641,848	24.9399	8.5362	.001607717	1,954.07	303,857.98

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
623	388,129	241,804,367	24.9600	8.5408	.001605136	1,957.21	304,835.80
624	389,376	242,970,624	24.9800	8.5453	.001602564	1,960.35	305,815.20
625	390,625	244,140,625	25.0000	8.5499	.001600000	1,963.50	306,796.16
626	391,876	245,314,376	25.0200	8.5544	.001597444	1,966.64	307,778.69
627	393,129	246,491,883	25.0400	8.5590	.001594896	1,969.78	308,762.79
628	394,384	247,673,152	25.0599	8.5635	.001592357	1,972.92	309,748.47
629	395,641	248,858,189	25.0799	8.5681	.001589825	1,976.06	310,735.71
630	396,900	250,047,000	25.0998	8.5726	.001587302	1,979.20	311,724.53
631	398,161	251,239,591	25.1197	8.5772	.001584786	1,982.35	312,714.92
632	399,424	252,435,968	25.1396	8.5817	.001582278	1,985.49	313,706.88
633	400,689	253,636,137	25.1595	8.5862	.001579779	1,988.63	314,700.40
634	401,956	254,840,104	25.1794	8.5907	.001577287	1,991.77	315,695.50
635	403,225	256,047,875	25.1992	8.5952	.001574803	1,994.91	316,692.17
636	404,496	257,259,456	25.2190	8.5997	.001572327	1,998.05	317,690.42
637	405,769	258,474,853	25.2389	8.6043	.001569859	2,001.19	318,690.23
638	407,044	259,694,072	25.2587	8.6088	.001567398	2,004.34	319,691.61
639	408,321	260,917,119	25.2784	8.6132	.001564945	2,007.48	320,694.56
640	409,600	262,144,000	25.2982	8.6177	.001562500	2,010.62	321,699.09
641	410,881	263,374,721	25.3180	8.6222	.001560062	2,013.76	322.705.18
642	412,164	264,609,288	25.3377	8.6267	.001557632	2,016.90	323,712.85
643	413,449	265,847,707	25.3574	8.6312	.001555210	2,020.04	324,722.09
644	414,736	267,089,984	25.3772	8.6357	.001552795	2,023.19	325,732.89
645	416,025	268,336,125	25.3969	8.6401	.001550388	2,026.33	326,745.27
646	417,316	269,586,136	25.4165	8.6446	.001547988	2,029.47	327,759.22
647	418,609	270,840,023	25.4362	8.6490	.001545595	2,032.61	328,774.74
648	419,904	272,097,792	25.4558	8.6535	.001543210	2,035.75	329,791.83
649	421,201	273,359,449	25.4755	8.6579	.001540832	2,038.89	330,810.49
650	422,500	274,625,000	25.4951	8.6624	.001538462	2,042.04	331,830.72
651	423,801	275,894,451	25.5147	8.6668	.001536098	2,045.18	332,852.53
652	425,104	277,167,808	25.5343	8.6713	.001533742	2,048.32	333,875.90
653	426,409	278,445,077	25.5539	8.6757	.001531394	2,051.46	334,900.85
654	427,716	279,726,264	25.5734	8.6801	.001529052	2,054.60	335,927.36
655	429,025	281,011,375	25.5930	8.6845	.001526718	2,057.74	336,955.45
656	430,336	282,300,416	25.6125	8.6890	.001524390	2,060.88	337,985.10
657	431,649	283,593,393	25.6320	8.6934	.001522070	2,064.03	339,016.33
658	432,964	284,890,312	25.6515	8.6978	.001519757	2,067.17	340,049.13
659	434,281	286,191,179	25.6710	8.7022	.001517451	2,070.31	341,083.50
660	435,600	287,496,000	25.6905	8.7066	.001515152	2,073.45	342,119.44
661	436,921	288,804,781	25.7099	8.7110	.001512859	2,076.59	343,156.95
662	438,244	290,117,528	25.7294	8.7154	.001510574	2,079.73	344,196.03
663	439,569	291,434,247	25.7488	8.7198	.001508296	2,082.88	345,236.69
664	440,896	292,754,944	25.7682	8.7241	.001506024	2,086.02	346,278.91
665	442,225	294,079,625	25.7876	8.7285	.001503759	2,089.16	347,322.70
666	443,556	295,408,296	25.8070	8.7329	.001501502	2,092.30	348,368.07
667	444,889	296,740,963	25.8263	8.7373	.001499250	2,095.44	349,415.00
668	446,224	298,077,632	25.8457	8.7416	.001497006	2,098.58	350,463.51
669	447,561	299,418,309	25.8650	8.7460	.001494768	2,101.73	351,513.59
670	448,900	300,763,000	25.8844	8.7503	.001492537	2,104.87	352,565.24
671	450,241	302,111,711	25.9037	8.7547	.001490313	2,108.01	353,618.45
672	451,584	303,464,448	25.9230	8.7590	.001488095	2,111.15	354,673.24
673	452,929	304,821,217	25.9422	8.7634	.001485884	2,114.29	355,729.60
674	454,276	306,182,024	25.9615	8.7677	.001483680	2,117.43	356,787.54
675	455,625	307,546,875	25.9808	8.7721	.001481481	2,120.58	357,847.04
676	456,976	308,915,776	26.0000	8.7764	.001479290	2,123.72	358,908.11
677	458,329	310,288,733	26.0192	8.7807	.001477105	2,126.86	359,970.75
678	459,684	311,665,752	26.0384	8.7850	.001474926	2,130.00	361,034.97
679	461,041	313,046,839	26.0576	8.7893	.001472754	2,133.14	362,100.75
680	462,400	314,432,000	26.0768	8.7937	.001470588	2,136.28	363,168.11
681	463,761	315,821,241	26.0960	8.7980	.001468429	2,139.42	364,237.04
682	465,124	317,214,568	26.1151	8.8023	.001466276	2,142.57	365,307.54
683	466,489	318,611,987	26.1343	8.8066	.001464129	2,145.71	366,379.60
684	467,856	320,013,504	26.1534	8.8109	.001461988	2,148.85	367,453.24
685	469,225	321,419,125	26.1725	8.8152	.001459854	2,151.99	368,528.45

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
686	470,596	322,828,856	26.1916	8.8194	.001457726	2,155.13	369,605.23
687	471,969	324,242,703	26.2107	8.8237	.001455604	2,158.27	370,683.59
688	473,344	325,660,672	26.2298	8.8280	.001453488	2,161.42	371,763.51
689	474,721	327,082,769	26.2488	8.8323	.001451379	2,164.56	372,845.00
690	476,100	328,509,000	26.2679	8.8366	.001449275	2,167.70	373,928.07
691	477,481	329,939,371	26.2869	8.8408	.001447178	2,170.84	375,012.70
692	478,864	331,373,888	26.3059	8.8451	.001445087	2,173.98	376,098.91
693	480,249	332,812,557	26.3249	8.8493	.001443001	2,177.12	377,186.68
694	481,636	334,255,384	26.3439	8.8536	.001440922	2,180.27	378,276.03
695	483,025	335,702,375	26.3629	8.8578	.001438849	2,183.41	379,366.95
696	484,416	337,153,536	26.3818	8.8621	.001436782	2,186.55	380,459.44
697	485,809	338,608,873	26.4008	8.8663	.001434720	2,189.69	381,553.50
698	487,204	340,068,392	26.4197	8.8706	.001432665	2,192.83	382,649.13
699	488,601	341,532,099	26.4386	8.8748	.001430615	2,195.97	383,746.33
700	490,000	343,000,000	26.4575	8.8790	.001428571	2,199.11	384,845.10
701	491,401	344,472,101	26.4764	8.8833	.001426534	2,202.26	385,945.44
702	492,804	345,948,408	26.4953	8.8875	.001424501	2,205.40	387,047.36
703	494,209	347,428,927	26.5141	8.8917	.001422475	2,208.54	388,150.84
704	495,616	348,913,664	26.5330	8.8959	.001420455	2,211.68	389,255.90
705	497,025	350,402,625	26.5518	8.9001	.001418440	2,214.82	390,362.52
706	498,436	351,895,816	26.5707	8.9043	.001416431	2,217.96	391,470.72
707	499,849	353,393,243	26.5895	8.9085	.001414427	2,221.11	392,580.49
708	501,264	354,894,912	26.6083	8.9127	.001412429	2,224.25	393,691.82
709	502,681	356,400,829	26.6271	8.9169	.001410437	2,227.39	394,804.73
710	504,100	357,911,000	26.6458	8.9211	.001408451	2,230.53	395,919.21
711	505,521	359,425,431	26.6646	8.9253	.001406470	2,233.67	397,035.26
712	506,944	360,944,128	26.6833	8.9295	.001404494	2,236.81	398,152.89
713	508,369	362,467,097	26.7021	8.9337	.001402525	2,239.96	399,272.08
714	509,796	363,994,344	26.7208	8.9378	.001400560	2,243.10	400,392.84
715	511,225	365,525,875	26.7395	8.9420	.001398601	2,246.24	401,515.18
716	512,656	367,061,696	26.7582	8.9462	.001396648	2,249.38	402,639.08
717	514,089	368,601,813	26.7769	8.9503	.001394700	2,252.52	403,764.56
718	515,524	370,146,232	26.7955	8.9545	.001392758	2,255.66	404,891.60
719	516,961	371,694,959	26.8142	8.9587	.001390821	2,258.81	406,020.22
720	518,400	373,248,000	26.8328	8.9628	.001388889	2,261.95	407,150.41
721	519,841	374,805,361	26.8514	8.9670	.001386963	2,265.09	408,282.17
722	521,284	376,367,048	26.8701	8.9711	.001385042	2,268.23	409,415.50
723	522,729	377,933,067	26.8887	8.9752	.001383126	2,271.37	410,550.40
724	524,176	379,503,424	26.9072	8.9794	.001381215	2,274.51	411,686.87
725	525,625	381,078,125	26.9258	8.9835	.001379310	2,277.65	412,824.91
726	527,076	382,657,176	26.9444	8.9876	.001377410	2,280.80	413,964.52
727	528,529	384,240,583	26.9629	8.9918	.001375516	2,283.94	415,105.71
728	529,984	385,828,352	26.9815	8.9959	.001373626	2,287.08	416,248.46
729	531,441	387,420,489	27.0000	9.0000	.001371742	2,290.22	417,392.79
730	532,900	389,017,000	27.0185	9.0041	.001369863	2,293.36	418,538.68
731	534,361	390,617,891	27.0370	9.0082	.001367989	2,296.50	419,686.15
732	535,824	392,223,168	27.0555	9.0123	.001366120	2,299.65	420,835.19
733	537,289	393,832,837	27.0740	9.0164	.001364256	2,302.79	421,985.79
734	538,756	395,446,904	27.0924	9.0205	.001362398	2,305.93	423,137.97
735	540,225	397,065,375	27.1109	9.0246	.001360544	2,309.07	424,291.72
736	541,696	398,688,256	27.1293	9.0287	.001358696	2,312.21	425,447.04
737	543,169	400,315,553	27.1477	9.0328	.001356852	2,315.35	426,603.94
738	544,644	401,947,272	27.1662	9.0369	.001355014	2,318.50	427,762.40
739	546,121	403,583,419	27.1846	9.0410	.001353180	2,321.64	428,922.43
740	547,600	405,224,000	27.2029	9.0450	.001351351	2,324.78	430,084.03
741	549,081	406,869,021	27.2213	9.0491	.001349528	2,327.92	431,247.21
742	550,564	408,518,488	27.2397	9.0532	.001347709	2,331.06	432,411.95
743	552,049	410,172,407	27.2580	9.0572	.001345895	2,334.20	433,578.27
744	553,536	411,830,784	27.2764	9.0613	.001344086	2,337.34	434,746.16
745	555,025	413,493,625	27.2947	9.0654	.001342282	2,340.49	435,915.62
746	556,516	415,160,936	27.3130	9.0694	.001340483	2,343.63	437,086.64
747	558,009	416,832,723	27.3313	9.0735	.001338688	2,346.77	438,259.24
748	559,504	418,508,992	27.3496	9.0775	.001336898	2,349.91	439,433.41

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
749	561,001	420,189,749	27.3679	9.0816	.001335113	2,353.05	440,609.16
750	562,500	421,875,000	27.3861	9.0856	.001333333	2,356.19	441,786.47
751	564,001	423,564,751	27.4044	9.0896	.001331558	2,359.34	442,965.35
752	565,504	425,259,008	27.4226	9.0937	.001329787	2,362.48	444,145.80
753	567,009	426,957,777	27.4408	9.0977	.001328021	2,365.62	445,327.83
754	568,516	428,661,064	27.4591	9.1017	.001326260	2,368.76	446,511.42
755	570,025	430,368,875	27.4773	9.1057	.001324503	2,371.90	447,696.59
756	571,536	432,081,216	27.4955	9.1098	.001322751	2,375.04	448,883.32
757	573,049	433,798,093	27.5136	9.1138	.001321004	2,378.19	450,071.63
758	574,564	435,519,512	27.5318	9.1178	.001319261	2,381.33	451,261.51
759	576,081	437,245,479	27.5500	9.1218	.001317523	2,384.47	452,452.96
760	577,600	438,976,000	27.5681	9.1258	.001315789	2,387.61	453,645.98
761	579,121	440,711,081	27.5862	9.1298	.001314060	2,390.75	454,840.57
762	580,644	442,450,728	27.6043	9.1338	.001312336	2,393.89	456,036.73
763	582,169	444,194,947	27.6225	9.1378	.001310616	2,397.04	457,234.46
764	583,696	445,943,744	27.6405	9.1418	.001308901	2,400.18	458,433.77
765	585,225	447,697,125	27.6586	9.1458	.001307190	2,403.32	459,634.64
766	586,756	449,455,096	27.6767	9.1498	.001305483	2,406.46	460,837.08
767	588,289	451,217,663	27.6948	9.1537	.001303781	2,409.60	462,041.10
768	589,824	452,984,832	27.7128	9.1577	.001302083	2,412.74	463,246.69
769	591,361	454,756,609	27.7308	9.1617	.001300390	2,415.88	464,453.84
770	592,900	456,533,000	27.7489	9.1657	.001298701	2,419.03	465,662.57
771	594,441	458,314,011	27.7669	9.1696	.001297017	2,422.17	466,872.87
772	595,984	460,099,648	27.7849	9.1736	.001295337	2,425.31	468,084.74
773	597,529	461,889,917	27.8029	9.1775	.001293661	2,428.45	469,298.18
774	599,076	463,684,824	27.8209	9.1815	.001291990	2,431.59	470,513.19
775	600,625	465,484,375	27.8388	9.1855	.001290323	2,434.73	471,729.77
776	602,176	467,288,576	27.8568	9.1894	.001288660	2,437.88	472,947.92
777	603,729	469,097,433	27.8747	9.1933	.001287001	2,441.02	474,167.65
778	605,284	470,910,952	27.8927	9.1973	.001285347	2,444.16	475,388.94
779	606,841	472,729,139	27.9106	9.2012	.001283697	2,447.30	476,611.81
780	608,400	474,552,000	27.9285	9.2052	.001282051	2,450.44	477,836.24
781	609,961	476,379,541	27.9464	9.2091	.001280410	2,453.58	479,062.25
782	611,524	478,211,768	27.9643	9.2130	.001278772	2,456.73	480,289.83
783	613,089	480,048,687	27.9821	9.2170	.001277139	2,459.87	481,518.97
784	614,656	481,890,304	28.0000	9.2209	.001275510	2,463.01	482,749.69
785	616,225	483,736,625	28.0179	9.2248	.001273885	2,466.15	483,981.98
786	617,796	485,587,656	28.0357	9.2287	.001272265	2,469.29	485,215.84
787	619,369	487,443,403	28.0535	9.2326	.001270648	2,472.42	486,451.28
788	620,944	489,303,872	28.0713	9.2365	.001269036	2,475.58	487,688.28
789	622,521	491,169,069	28.0891	9.2404	.001267427	2,478.72	488,926.85
790	624,100	493,039,000	28.1069	9.2443	.001265823	2,481.86	490,166.99
791	625,681	494,913,671	28.1247	9.2482	.001264223	2,485.00	491,408.71
792	627,264	496,793,088	28.1425	9.2521	.001262626	2,488.14	492,651.99
793	628,849	498,677,257	28.1603	9.2560	.001261034	2,491.28	493,896.85
794	630,436	500,566,184	28.1780	9.2599	.001259446	2,494.42	495,143.28
795	632,025	502,459,875	28.1957	9.2638	.001257862	2,497.57	496,391.27
796	633,616	504,358,336	28.2135	9.2677	.001256281	2,500.71	497,640.84
797	635,209	506,261,573	28.2312	9.2716	.001254705	2,503.85	498,891.98
798	636,804	508,169,592	28.2489	9.2754	.001253133	2,506.99	500,144.69
799	638,401	510,082,399	28.2666	9.2793	.001251564	2,510.13	501,398.97
800	640,000	512,000,000	28.2843	9.2832	.001250000	2,513.27	502,654.82
801	641,601	513,922,401	28.3019	9.2870	.001248439	2,516.42	503,912.25
802	643,204	515,849,608	28.3196	9.2909	.001246883	2,519.56	505,171.24
803	644,809	517,781,627	28.3373	9.2948	.001245330	2,522.70	506,431.80
804	646,416	519,718,464	28.3549	9.2986	.001243781	2,525.84	507,693.94
805	648,025	521,660,125	28.3725	9.3025	.001242236	2,528.98	508,957.64
806	649,636	523,606,616	28.3901	9.3063	.001240695	2,532.12	510,222.92
807	651,249	525,557,943	28.4077	9.3102	.001239157	2,535.27	511,489.77
808	652,864	527,514,112	28.4253	9.3140	.001237624	2,538.41	512,758.19
809	654,481	529,475,129	28.4429	9.3179	.001236094	2,541.55	514,028.18
810	656,100	531,441,000	28.4605	9.3217	.001234568	2,544.69	515,299.74
811	657,721	533,411,731	28.4781	9.3255	.001233046	2,547.83	516,572.87

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
812	659,344	535,387,328	28.4956	9.3294	.001231527	2,550.97	517,847.57
813	660,969	537,367,797	28.5132	9.3332	.001230012	2,554.11	519,123.84
814	662,596	539,353,144	28.5307	9.3370	.001228501	2,557.26	520,401.68
815	664,225	541,343,375	28.5482	9.3408	.001226994	2,560.40	521,681.10
816	665,856	543,338,496	28.5657	9.3447	.001225490	2,563.54	522,962.08
817	667,489	545,338,513	28.5832	9.3485	.001223990	2,566.68	524,244.63
818	669,124	547,343,432	28.6007	9.3523	.001222494	2,569.82	525,528.76
819	670,761	549,353,259	28.6182	9.3561	.001221001	2,572.96	526,814.46
820	672,400	551,368,000	28.6356	9.3599	.001219512	2,576.11	528,101.73
821	674,041	553,387,661	28.6531	9.3637	.001218027	2,579.25	529,390.56
822	675,684	555,412,248	28.6705	9.3675	.001216545	2,582.39	530,680.97
823	677,329	557,441,767	28.6880	9.3713	.001215067	2,585.53	531,972.95
824	678,976	559,476,224	28.7054	9.3751	.001213592	2,588.67	533,266.50
825	680,625	561,515,625	28.7228	9.3789	.001212121	2,591.81	534,561.62
826	682,276	563,559,976	28.7402	9.3827	.001210654	2,594.96	535,858.32
827	683,929	565,609,283	28.7576	9.3865	.001209190	2,598.10	537,156.58
828	685,584	567,663,552	28.7750	9 3902	.001207729	2,601.24	538,456.41
829	687,241	569,722,789	28.7924	9.3940	.001206273	2,604.38	539,757.82
830	688,900	571,787,000	28.8097	9.3978	.001204819	2,607.52	541,060.79
831	690,561	573,856,191	28.8271	9.4016	.001203369	2,610.66	542,365.34
832	692,224	575,930,368	28.8444	9.4053	.001201923	2,613.81	543,671.46
833	693,889	578,009,537	28.8617	9.4091	.001200480	2,616.95	544,979.15
834	695,556	580,093,704	28.8791	9.4129	.001199041	2,620.09	546,288.40
835	697,225	582,182,875	28.8964	9.4166	.001197605	2,623.23	547,599.23
836	698,896	584,277,056	28.9137	9.4204	.001196172	2,626.37	548,911.63
837	700,569	586,376,253	28.9310	9.4241	.001194743	2,629.51	550,225.61
838	702,244	588,480,472	28.9482	9.4279	.001193317	2,632.65	551,541.15
839	703,921	590,589,719	28.9655	9.4316	.001191895	2,635.80	552,858.26
840	705,600	592,704,000	28.9828	9.4354	.001190476	2,638.94	554,176.94
841	707,281	594,823,321	29.0000	9.4391	.001189061	2,642.08	555,497.20
842	708,964	596,947,688	29.0172	9.4429	.001187648	2,645.22	556,819.02
843	710,649	599,077,107	29.0345	9.4466	.001186240	2,648.36	558,142.42
844	712,336	601,211,584	29.0517	9.4503	.001184834	2,651.50	559,467.39
845	714,025	603,351,125	29.0689	9.4541	.001183432	2,654.65	560,793.92
846	715,716	605,495,736	29.0861	9.4578	.001182033	2,657.79	562,122.03
847	717,409	607,645,423	29.1033	9.4615	.001180638	2,660.93	563,451.71
848	719,104	609,800,192	29.1204	9.4652	.001179245	2,664.07	564,782.96
849	720,801	611,960,049	29.1376	9.4690	.001177856	2,667.21	566,115.78
850	722,500	614,125,000	29.1548	9.4727	.001176471	2,670.35	567,450.17
851	724,201	616,295,051	29.1719	9.4764	.001175088	2,673.50	568,786.14
852	725,904	618,470,208	29.1890	9.4801	.001173709	2,676.64	570,123.67
853	727,609	620,650,477	29.2062	9.4838	.001172333	2,679.78	571,462.77
854	729,316	622,835,864	29.2233	9.4875	.001170960	2,682.92	572,803.45
855	731,025	625,026,375	29.2404	9.4912	.001169591	2,686.06	574,145.69
856	732,736	627,222,016	29.2575	9.4949	.001168224	2,689.20	575,489.51
857	734,449	629,422,793	29.2746	9.4986	.001166861	2,692.34	576,834.90
858	736,164	631,628,712	29.2916	9.5023	.001165501	2,695.49	578,181.85
859	737,881	633,839,779	29.3087	9.5060	.001164144	2,698.63	579,530.38
860	739,600	636,056,000	29.3258	9.5097	.001162791	2,701.77	580,880.48
861	741,321	638,277,381	29.3428	9.5134	.001161440	2,704.91	582,232.15
862	743,044	640,503,928	29.3598	9.5171	.001160093	2,708.05	583,585.39
863	744,769	642,735,647	29.3769	9.5207	.001158749	2,711.19	584,940.20
864	746,496	644,972,544	29.3939	9.5244	.001157407	2,714.34	586,296.59
865	748,225	647,214,625	29.4109	9.5281	.001156069	2,717.48	587,654.54
866	749,956	649,461,896	29.4279	9.5317	.001154734	2,720.62	589,014.07
867	751,689	651,714,363	29.4449	9.5354	.001153403	2,723.76	590,375.16
868	753,424	653,972,032	29.4618	9.5391	.001152074	2,726.90	591,737.83
869	755,161	656,234,909	29.4788	9.5427	.001150748	2,730.04	593,102.06
870	756,900	658,503,000	29.4958	9.5464	.001149425	2,733.19	594,467.87
871	758,641	660,776,311	29.5127	9.5501	.001148106	2,736.33	595,835.25
872	760,384	663,054,848	29.5296	9.5537	.001146789	2,739.47	597,204.20
873	762,129	665,338,617	29.5466	9.5574	.001145475	2,742.61	598,574.72
874	763,876	667,627,624	29.5635	9.5610	.001144165	2,745.75	599,946.81

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
875	765,625	669,921,875	29.5804	9.5647	.001142857	2,748.89	601,320.47
876	767,376	672,221,376	29.5973	9.5683	.001141553	2,752.04	602,695.70
877	769,129	674,526,133	29.6142	9.5719	.001140251	2,755.18	604,072.50
878	770,884	676,836,152	29.6311	9.5756	.001138952	2,758.32	605,450.88
879	772,641	679,151,439	29.6479	9.5792	.001137656	2,761.46	606,830.82
880	774,400	681,472,000	29.6648	9.5828	.001136364	2,764.60	608,212.34
881	776,161	683,797.841	29.6816	9.5865	.001135074	2,767.74	609,595.42
882	777,924	686,128,968	29.6985	9.5901	.001133787	2,770.88	610,980.08
883	779.689	688,465,387	29.7153	9.5937	.001132503	2,774.03	612,366.31
884	781,456	690,807,104	29.7321	9.5973	.001131222	2,777.17	613,754.11
885	783,225	693,154,125	29.7489	9.6010	.001129944	2,780.31	615,143.48
886	784.996	695,506,456	29.7658	9.6046	.001128668	2,783.45	616,534.42
887	786.769	697,864,103	29.7825	9.6082	.001127396	2,786.59	617,926.93
888	788.544	700,227,072	29.7993	9.6118	.001126126	2,789.73	619,321.01
889	790,321	702,595,369	29.8161	9.6154	.001124859	2,792.88	620,716.66
890	792,100	704,969,000	29.8329	9.6190	.001123596	2,796.02	622,113.89
891	793,881	707,347,971	29.8496	9.6226	.001122334	2,799.16	623,512.68
892	795,664	709.732,288	29.8664	9.6262	.001121076	2,802.30	624,913.04
893	797,449	712,121,957	29.8831	9.6298	.001119821	2,805.44	626,314.98
894	799,236	714,516,984	29.8998	9.6334	.001118568	2,808.58	627,718.49
895	801,025	716,917,375	29.9166	9.6370	.001117318	2,811.73	629,123.56
896	802,816	719,323,136	29.9333	9.6406	.001116071	2,814.87	630,530.21
897	804,609	721,734,273	29.9500	9.6442	.001114827	2,818.01	631,938.43
898	806.404	724,150,792	29.9666	9.6477	.001113586	2,821.15	633,348.22
899	808,201	726,572,699	29.9833	9.6513	.001112347	2,824.29	634,759.58
900	810,000	729,000,000	30.0000	9.6549	.001111111	2,827.43	636,172.51
901	811,801	731,432,701	30.0167	9.6585	.001109878	2,830.58	637,587.01
902	813,604	733,870,808	30.0333	9.6620	.001108647	2,833.72	639,003.09
903	815,409	736,314,327	30.0500	9.6656	.001107420	2,836.86	640,420.73
904	817,216	738,763,264	30.0666	9.6692	.001106195	2,840.00	641,839.95
905	819,025	741,217,625	30.0832	9.6727	.001104972	2,843.14	643,260.73
906	820,836	743,677,416	30.0998	9.6763	.001103753	2,846.28	644,683.09
907	822,649	746,142,643	30.1164	9.6799	.001102536	2,849.42	646,107.01
908	824,464	748,613,312	30.1330	9.6834	.001101322	2,852.57	647,532.51
909	826,281	751,089,429	30.1496	9.6870	.001100110	2,855.71	648,959.58
910	828.100	753,571,000	30.1662	9.6905	.001098901	2,858.85	650,388.22
911	829,921	756,058,031	30.1828	9.6941	.001097695	2,861.99	651,818.43
912	831,744	758,550,528	30.1993	9.6976	.001096491	2,865.13	653,250.21
913	833,569	761,048,497	30.2159	9.7012	.001095290	2,868.27	654,683.56
914	835,396	763,551,944	30.2324	9.7047	.001094092	2,871.42	656,118.48
915	837,225	766,060,875	30.2490	9.7082	.001092896	2,874.56	657,554.98
916	839,056	768,575,296	30.2655	9.7118	.001091703	2,877.70	658,993.04
917	840,889	771,095,213	30.2820	9.7153	.001090513	2,880.84	660,432.68
918	842,724	773,620,632	30.2985	9.7188	.001089325	2,883.98	661,873.88
919	844,561	776,151,559	30.3150	9.7224	.001088139	2,887.12	663,316.66
920	846,400	778,688,000	30.3315	9.7259	.001086957	2,890.27	664,761.01
921	848,241	781,229,961	30.3480	9.7294	.001085776	2,893.41	666,206.92
922	850,084	783,777,448	30.3645	9.7329	.001084599	2,896.55	667,654.41
923	851,929	786,330,467	30.3809	9.7364	.001083424	2,899.69	669,103.47
924	853,776	788,889,024	30.3974	9.7400	.001082251	2,902.83	670,554.10
925	855,625	791,453,125	30.4138	9.7435	.001081081	2,905.97	672,006.30
926	857,476	794,022,776	30.4302	9.7470	.001079914	2,909.11	673,460.08
927	859,329	796,597,983	30.4467	9.7505	.001078749	2,912.26	674,915.42
928	861,184	799,178,752	30.4631	9.7540	.001077586	2,915.40	676,372.33
929	863,041	801,765,089	30.4795	9.7575	.001076426	2,918.54	677,830.82
930	864.900	804,357,000	30.4959	9.7610	.001075269	2,921.68	679,290.87
931	866,761	806,954,491	30.5123	9.7645	.001074114	2,924.82	680,752.50
932	868.624	809,557,568	30.5287	9.7680	.001072961	2,927.96	682,215.69
933	870,489	812,166,237	30.5450	9.7715	.001071811	2,931.11	683,680.46
934	872,356	814,780,504	30.5614	9.7750	.001070664	2,934.25	685,146.80
935	874,225	817,400,375	30.5778	9.7785	.001069519	2,937.39	686,614.71
936	876,096	820,025,856	30.5941	9.7819	.001068376	2,940.53	688,084.19
937	877,969	822,656,953	30.6105	9.7854	.001067236	2,943 67	689,555.24

No.	Square	Cube	Sq. Root	Cu. Root	Reciprocal	Circum.	Area
938	879,844	825,293,672	30.6268	9.7889	.001066098	2,946.81	691,027.36
939	881,721	827,936,019	30.6431	9.7924	.001064963	2,949.96	692,502.05
940	883,600	830,584,000	30.6594	9.7959	.001063830	2,953.10	693,977.82
941	885,481	833,237,621	30.6757	9.7993	.001062699	2,956.24	695,455.15
942	887,364	835,896,888	30.6920	9.8028	.001061571	2,959.38	696,934.06
943	889,249	838,561,807	30.7083	9.8063	.001060445	2,962.52	698,414.53
944	891,136	841,232,384	30.7246	9.8097	.001059322	2,965.66	699,896.58
945	893,025	843,908,625	30.7409	9.8132	.001058201	2,968.81	701,380.19
946	894,916	846,590,536	30.7571	9.8167	.001057082	2,971.95	702,865.38
947	896,809	849,278,123	30.7734	9.8201	.001055966	2,975.09	704,352.14
948	898,704	851,971,392	30.7896	9.8236	.001054852	2,978.23	705,840.47
949	900,601	854,670,349	30.8058	9.8270	.001053741	2,981.37	707,330.37
950	902,500	857,375,000	30.8221	9.8305	.001052632	2,984.51	708,821.84
951	904,401	860,085,351	30.8383	9.8339	.001051525	2,987.65	710,314.88
952	906,304	862,801,408	30.8545	9.8374	.001050420	2,990.80	711,809.50
953	908,209	865,523,177	30.8707	9.8408	.001049318	2,993.94	713,305.68
954	910,116	868,250,664	30.8869	9.8443	.001048218	2,997.08	714,803.43
955	912,025	870,983,875	30.9031	9.8477	.001047120	3,000.22	716,302.76
956	913,936	873,722,816	30.9192	9.8511	.001046025	3,003.36	717,803.66
957	915,849	876,467,493	30.9354	9.8546	.001044932	3,006.50	719,306.12
958	917,764	879,217,912	30.9516	9.8580	.001043841	3,009.65	720,810.16
959	919,681	881,974,079	30.9677	9.8614	.001042753	3,012.79	722,315.77
960	921,600	884,736,000	30.9839	9.8648	.001041667	3,015.93	723,822.95
961	923,521	887,503,681	31.0000	9.8683	.001040583	3,019.07	725,331.70
962	925,444	890,277,128	31.0161	9.8717	.001039501	3,022.21	726,842.02
963	927,369	893,056,347	31.0322	9.8751	.001038422	3,025.35	728,353.91
964	929,296	895,841,344	31.0483	9.8785	.001037344	3,028.50	729,867.37
965	931,225	898,632,125	31.0644	9.8819	.001036269	3,031.64	731,382.40
966	933,156	901,428,696	31.0805	9.8854	.001035197	3,034.78	732,899.01
967	935,089	904,231,063	31.0966	9.8888	.001034126	3,037.92	734,417.18
968	937,024	907,039,232	31.1127	9.8922	.001033058	3,041.06	735,936.93
969	938,961	909,853,209	31.1288	9.8956	.001031992	3,044.20	737,458.24
970	940,900	912,673,000	31.1448	9.8990	.001030928	3,047.34	738,981.13
971	942,841	915,498,611	31.1609	9.9024	.001029866	3,050.49	740,505.59
972	944,784	918,330,048	31.1769	9.9058	.001028807	3,053.63	742,031.62
973	946,729	921,167,317	31.1929	9.9092	.001027749	3,056.77	743,559.22
974	948,676	924,010,424	31.2090	9.9126	.001026694	3,059.91	745,088.39
975	950,625	926,859,375	31.2250	9.9160	.001025641	3,063.05	746,619.13
976	952,576	929,714,176	31.2410	9.9194	.001024590	3,066.19	748,151.44
977	954,529	932,574,833	31.2570	9.9227	.001023541	3,069.34	749,685.32
978	956,484	935,441,352	31.2730	9.9261	.001022495	3,072.48	751,220.78
979	958,441	938,313,739	31.2890	9.9295	.001021450	3,075.62	752,757.80
980	960,400	941,192,000	31.3050	9.9329	.001020408	3,078.76	754,296.40
981	962,361	944,076,141	31.3209	9.9363	.001019368	3,081.90	755,836.56
982	964,324	946,966,168	31.3369	9.9396	.001018330	3,085.04	757,378.30
983	966,289	949,862,087	31.3528	9.9430	.001017294	3,088.19	758,921.61
984	968,256	952,763,904	31.3688	9.9464	.001016260	3,091.33	760,466.48
985	970,225	955,671,625	31.3847	9.9497	.001015228	3,094.47	762,012.93
986	972,196	958,585,256	31.4006	9.9531	.001014199	3,097.61	763,560.95
987	974,169	961,504,803	31.4166	9.9565	.001013171	3,100.75	765,110.54
988	976,144	964,430,272	31.4325	9.9598	.001012146	3,103.89	766,661.70
989	978,121	967,361,669	31.4484	9.9632	.001011122	3,107.04	768,214.44
990	980,100	970,299,000	31.4643	9.9666	.001010101	3,110.18	769,768.74
991	982,081	973,242,271	31.4802	9.9699	.001009082	3,113.32	771,324.61
992	984,064	976,191,488	31.4960	9.9733	.001008065	3,116.46	772,882.06
993	986,049	979,146,657	31.5119	9.9766	.001007049	3,119.60	774,441.07
994	988,036	982,107,784	31.5278	9.9800	.001006036	3,122.74	776,001.66
995	990,025	985,074,875	31.5436	9.9833	.001005025	3,125.88	777,563.82
996	992,016	988,047,936	31.5595	9.9866	.001004016	3,129.03	779,127.54
997	994,009	991,026,973	31.5753	9.9900	.001003009	3,132.17	780,692.84
998	996,004	994,011,992	31.5911	9.9933	.001002004	3,135.31	782,259.71
999	998,001	997,002,999	31.6070	9.9967	.001001001	3,138.45	783,828.15
1000	1,000,000	1,000,000,000	31.6228	10.0000	.001000000	3,141.59	785,398.16

TABLE II.—Fifth Roots and Fifth Powers

Power	No. or root	Power	No. or root	Power	No. or root	Power	No. or root
.0000100	.1	.004219	.335	.558406	.89	36.2051	2.05
.0000110	.102	.004544	.340	.590490	.90	40.8410	2.10
.0000122	.104	.004888	.345	.624032	.91	45.9401	2.15
.0000134	.106	.005252	.350	.659082	.92	51.5363	2.20
.0000147	**.108**	**.005638**	**.355**	**.695688**	**.93**	**57.6650**	**2.25**
.0000161	.110	.006047	.360	.733904	.94	64.3634	2.30
.0000176	.112	.006478	.365	.773781	.95	71.6703	2.35
.0000193	.114	.006934	.370	.815373	.96	79.6262	2.40
.0000210	.116	.007416	.375	.858734	.97	88.2735	2.45
.0000229	**.118**	**.007924**	**.380**	**.903021**	**.98**	**97.6562**	**2.50**
.0000249	.120	.008459	.385	.950990	.99	107.820	2.55
.0000270	.122	.009022	.390	1.0	1.00	118.814	2.60
.0000293	.124	.009616	.395	1.10408	1.02	130.686	2.65
.0000318	.126	.010240	.400	1.21665	1.04	143.489	2.70
.0000344	**.128**	**.011586**	**.41**	**1.33823**	**1.06**	**157.276**	**2.75**
.0000371	.130	.013069	.42	1.46933	1.08	172.104	2.80
.0000401	.132	.014701	.43	1.61051	1.10	188.029	2.85
.0000432	.134	.016492	.44	1.76234	1.12	205.111	2.90
.0000465	.136	.018453	.45	1.92541	1.14	223.414	2.95
.0000500	**.138**	**.020596**	**.46**	**2.10034**	**1.16**	**243.000**	**3.00**
.0000538	.140	.022935	.47	2.28775	1.18	263.936	3.05
.0000577	.142	.025480	.48	2.48832	1.20	286.292	3.10
.0000619	.144	.028248	.49	2.70271	1.22	310.136	3.15
.0000663	.146	.031250	.50	2.93163	1.24	335.544	3.20
.0000710	**.148**	**.034503**	**.51**	**3.17580**	**1.26**	**362.591**	**3.25**
.0000754	.150	.038020	.52	3.43597	1.28	391.354	3.30
.0000895	.155	.041820	.53	3.71293	1.30	421.419	3.35
.000105	.160	.045917	.54	4.00746	1.32	454.354	3.40
.000122	.165	.050328	.55	4.32040	1.34	488.760	3.45
.000142	**.170**	**.055073**	**.56**	**4.65259**	**1.36**	**525.219**	**3.50**
.000164	.175	.060169	.57	5.00490	1.38	563.822	3.55
.000189	.180	.065636	.58	5.37824	1.40	604.662	3.60
.000217	.185	.071492	.59	5.77353	1.42	647.835	3.65
.000248	.190	.077760	.60	6.19174	1.44	693.440	3.70
.000282	**.195**	**.084460**	**.61**	**6.63383**	**1.46**	**741.577**	**3.75**
.000320	.200	.091613	.62	7.10082	1.48	792.352	3.80
.000362	.205	.099244	.63	7.59375	1.50	845.870	3.85
.000408	.210	.107374	.64	8.11368	1.52	902.242	3.90
.000459	.215	.116029	.65	8.66171	1.54	961.58	3.95
.000515	**.220**	**.125233**	**.66**	**9.23896**	**1.56**	**1,024.00**	**4.00**
.000577	.225	.135012	.67	9.84658	1.58	1,089.62	4.05
.000644	.230	.145393	.68	10.4858	1.60	1,158.56	4.10
.000717	.235	.156403	.69	11.1577	1.62	1,230.95	4.15
.000796	.240	.168070	.70	11.8637	1.64	1,306.91	4.20
.000883	**.245**	**.180423**	**.71**	**12.6049**	**1.66**	**1,386.58**	**4.25**
.000977	.250	.193492	.72	13.3828	1.68	1,470.08	4.30
.001078	.255	.207307	.73	14.1986	1.70	1,557.57	4.35
.001188	.260	.221901	.74	15.0537	1.72	1,649.16	4.40
.001307	.265	.237305	.75	15.9495	1.74	1,745.02	4.45
.001435	**.270**	**.253553**	**.76**	**16.8874**	**1.76**	**1,845.28**	**4.50**
.001573	.275	.270678	.77	17.8690	1.78	1,950.10	4.55
.001721	.280	.288717	.78	18.8957	1.80	2,059.63	4.60
.001880	.285	.307706	.79	19.9690	1.82	2,174.03	4.65
.002051	.290	.327680	.80	21.0906	1.84	2,293.45	4.70
.002234	**.295**	**.348678**	**.81**	**22.2620**	**1.86**	**2,418.07**	**4.75**
.002430	.300	.370740	.82	23.4849	1.88	2,548.04	4.80
.002639	.305	.393904	.83	24.7610	1.90	2,683.54	4.85
.002863	.310	.418212	.84	26.0919	1.92	2,824.75	4.90
.003101	.315	.443705	.85	27.4795	1.94	2,971.84	4.95
.003355	**.320**	**.470427**	**.86**	**28.9255**	**1.96**	**3,125.00**	**5.00**
.003626	.325	.498421	.87	30.4317	1.98	3,450.25	5.10
.003914	.330	.527732	.88	32.0000	2.00	3,802.04	5.20

Pages 17 and 18 from Peirce and Carver's "Formulas and Tables for Engineers."

Fifth Roots and Fifth Powers (*Continued*)

Power	No. or root	Power	No. or root	Power	No. or root
4,181.95	5.30	228,776	11.8	6,436,343	23.0
4,591.65	5.40	248,832	12.0	6,721,093	23.2
5,032.84	5.50	270,271	12.2	7,015,834	23.4
5,507.32	5.60	293,163	12.4	7,320,825	23.6
6,016.92	**5.70**	**317,580**	**12.6**	**7,636,332**	**23.8**
6,563.57	5.80	343,597	12.8	7,962,624	24.0
7,149.24	5.90	371,293	13.0	8,299,976	24.2
7,776.00	6.00	400,746	13.2	8,648,666	24.4
8,445.96	6.10	432,040	13.4	9,008,978	24.6
9,161.33	**6.20**	**465,259**	**13.6**	**9,381,200**	**24.8**
9,924.37	6.30	500,490	13.8	9,765,625	25.0
10,737	6.40	537,824	14.0	10,162,550	25.2
11,603	6.50	577,353	14.2	10,572,278	25.4
12,523	6.60	619,174	14.4	10,995,116	25.6
13,501	**6.70**	**663,383**	**14.6**	**11,431,377**	**25.8**
14,539	6.80	710,082	14.8	11,881,376	26.0
15,640	6.90	759,375	15.0	12,345,437	26.2
16,807	7.00	811,368	15.2	12,823,886	26.4
18,042	7.10	866,171	15.4	13,317,055	26.6
19,349	**7.20**	**923,896**	**15.6**	**13,825,281**	**26.8**
20,731	7.30	984,658	15.8	14,348,907	27.0
22,190	7.40	1,048,576	16.0	14,888,280	27.2
23,730	7.50	1,115,771	16.2	15,443,752	27.4
25,355	7.60	1,186,367	16.4	16,015,681	27.6
27,068	**7.70**	**1,260,493**	**16.6**	**16,604,430**	**27.8**
28,872	7.80	1,338,278	16.8	17,210,368	28.0
30,771	7.90	1,419,857	17.0	17,833,868	28.2
32,768	8.00	1,505,366	17.2	18,475,309	28.4
34,868	8.10	1,594,947	17.4	19,135,075	28.6
37,074	**8.20**	**1,688,742**	**17.6**	**19,813,557**	**28.8**
39,390	8.30	1,786,899	17.8	20,511,149	29.0
41,821	8.40	1,889,568	18.0	21,228,253	29.2
44,371	8.50	1,996,903	18.2	21,965,275	29.4
47,043	8.60	2,109,061	18.4	22,722,628	29.6
49,842	**8.70**	**2,226,203**	**18.6**	**23,500,728**	**29.8**
52,773	8.80	2,348,493	18.8	24,300,000	30.0
55,841	8.90	2,476,099	19.0	26,393,634	30.5
59,049	9.00	2,609,193	19.2	28,629,151	31.0
62,403	9.10	2,747,949	19.4	31,013,642	31.5
65,908	**9.20**	**2,892,547**	**19.6**	**33,554,432**	**32.0**
69,569	9.30	3,043,168	19.8	36,259,082	32.5
73,390	9.40	3,200,000	20.0	39,135,393	33.0
77,378	9.50	3,363,232	20.2	42,191,410	33.5
81,537	9.60	3,533,059	20.4	45,435,424	34.0
85,873	**9.70**	**3,709,677**	**20.6**	**48,875,980**	**34.5**
90,392	9.80	3,893,289	20.8	52,521,875	35.0
95,099	9.90	4,084,101	21.0	56,382,167	35.5
100,000	10.0	4,282,322	21.2	60,466,176	36.0
110,408	10.2	4,488,166	21.4	64,783,487	36.5
121,665	**10.4**	**4,701,850**	**21.6**	**69,343,957**	**37.0**
133,823	10.6	4,923,597	21.8	74,157,715	37.5
146,933	10.8	5,153,632	22.0	79,235,168	38.0
161,051	11.0	5,392,186	22.2	84,587,005	38.5
176,234	11.2	5,639,493	22.4	90,224,199	39.0
192,541	**11.4**	**5,859,793**	**22.6**	**96,158,012**	**39.5**
210,034	11.6	6,161,327	22.8	102,400,000	40.0

TABLE III

CIRCUMFERENCES AND AREAS OF CIRCLES FROM 1–64 to 100

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
1/64	.0491	.0002	6	18.8496	28.2743	13 1/4	41.2334	135.297
1/32	.0982	.0008	6 1/8	19.2423	29.4647	13 3/8	41.6261	137.886
1/16	.1963	.0031	6 1/4	19.6350	30.6796	13 1/2	42.0188	140.500
1 3/64	.3927	.0123	6 3/8	20.0277	31.9191	13 5/8	42.4115	143.139
3/16	.5890	.0276	6 1/2	20.4204	33.1831	13 3/4	42.8042	145.802
1/4	.7854	.0491	6 5/8	20.8131	34.4716	13 7/8	43.1969	148.489
5/16	.9817	.0767	6 3/4	21.2058	35.7847	14	43.5896	151.201
3/8	1.1781	.1104	6 7/8	21.5984	37.1223	14 1/8	43.9823	153.938
7/16	1.3744	.1503	7	21.9911	38.4845	14 1/4	44.3750	156.699
1/2	1.5708	.1963	7 1/8	22.3838	39.8713	14 3/8	44.7677	159.485
9/16	1.7671	.2485	7 1/4	22.7765	41.2825	14 1/2	45.1604	162.295
5/8	1.9635	.3068	7 3/8	23.1692	42.7183	14 5/8	45.5531	165.130
11/16	2.1598	.3712	7 1/2	23.5619	44.1786	14 3/4	45.9458	167.989
3/4	2.3562	.4418	7 5/8	23.9546	45.6635	14 7/8	46.3385	170.873
13/16	2.5525	.5185	7 3/4	24.3473	47.1730	15	46.7312	173.782
7/8	2.7489	.6013	7 7/8	24.7400	48.7070	15 1/8	47.1239	176.715
15/16	2.9452	.6903	8	25.1327	50.2655	15 1/4	47.5166	179.672
1	3.1416	.7854	8 1/8	25.5254	51.8486	15 3/8	47.9093	182.654
1 1/8	3.5343	.9940	8 1/4	25.9181	53.4562	15 1/2	48.3020	185.661
1 1/4	3.9270	1.2272	8 3/8	26.3108	55.0883	15 5/8	48.6947	188.692
1 3/8	4.3197	1.4849	8 1/2	26.7035	56.7450	15 3/4	49.0874	191.748
1 1/2	4.7124	1.7671	8 5/8	27.0962	58.4263	15 7/8	49.4801	194.828
1 5/8	5.1051	2.0739	8 3/4	27.4889	60.1320	16	49.8728	197.933
1 3/4	5.4978	2.4053	8 7/8	27.8816	61.8624	16	50.2655	201.062
1 7/8	5.8905	2.7611	9	28.2743	63.6173	16 1/8	50.6582	204.216
2	6.2832	3.1416	9 1/8	28.6670	65.3967	16 1/4	51.0509	207.394
2 1/8	6.6759	3.5466	9 1/4	29.0597	67.2006	16 3/8	51.4436	210.597
2 1/4	7.0686	3.9761	9 3/8	29.4524	69.0291	16 1/2	51.8363	213.825
2 3/8	7.4613	4.4301	9 1/2	29.8451	70.3822	16 5/8	52.2290	217.077
2 1/2	7.8540	4.9087	9 5/8	30.2378	72.7598	16 3/4	52.6217	220.353
2 5/8	8.2467	5.4119	9 3/4	30.6305	74.6619	16 7/8	53.0144	223.654
2 3/4	8.6394	5.9396	9 7/8	31.0232	76.589	17	53.4071	226.980
2 7/8	9.0321	6.4918	10	31.4159	78.540	17 1/8	53.7998	230.330
3	9.4248	7.0686	10 1/8	31.8086	80.516	17 1/4	54.1925	233.705
3 1/8	9.8175	7.6699	10 1/4	32.2013	82.516	17 3/8	54.5852	237.104
3 1/4	10.2102	8.2958	10 3/8	32.5940	84.541	17 1/2	54.9779	240.528
3 3/8	10.6029	8.9462	10 1/2	32.9867	86.590	17 5/8	55.3706	243.977
3 1/2	10.9956	9.6211	10 5/8	33.3794	88.664	17 3/4	55.7633	247.450
3 5/8	11.3883	10.3206	10 3/4	33.7721	90.763	17 7/8	56.1560	250.947
3 3/4	11.7810	11.0447	10 7/8	34.1648	92.886	18	56.5487	254.469
3 7/8	12.1737	11.7932	11	34.5575	95.033	18 1/8	56.9414	258.016
4	12.5664	12.5664	11 1/8	34.9502	97.205	18 1/4	57.3341	261.587
4 1/8	12.9591	13.3640	11 1/4	35.3429	99.402	18 3/8	57.7268	265.182
4 1/4	13.3518	14.1863	11 3/8	35.7356	101.623	18 1/2	58.1195	268.803
4 3/8	13.7445	15.0330	11 1/2	36.1283	103.869	18 5/8	58.5122	272.447
4 1/2	14.1372	15.9043	11 5/8	36.5210	106.139	18 3/4	58.9049	276.117
4 5/8	14.5299	16.8002	11 3/4	36.9137	108.434	18 7/8	59.2976	279.810
4 3/4	14.9226	17.7205	11 7/8	37.3064	110.753	19	59.6903	283.529
4 7/8	15.3153	18.6655	12	37.6991	113.097	19 1/8	60.0830	287.272
5	15.7080	19.6350	12 1/8	38.0918	115.466	19 1/4	60.4757	291.039
5 1/8	16.1007	20.6290	12 1/4	38.4845	117.859	19 3/8	60.8684	294.831
5 1/4	16.4934	21.6475	12 3/8	38.8772	120.276	19 1/2	61.2611	298.648
5 3/8	16.8861	22.6906	12 1/2	39.2699	122.718	19 5/8	61.6538	302.489
5 1/2	17.2788	23.7583	12 5/8	39.6626	125.185	19 3/4	62.0465	306.354
5 5/8	17.6715	24.8505	12 3/4	40.0553	127.676	19 7/8	62.4392	310.245
5 3/4	18.0642	25.9672	12 7/8	40.4480	130.192	20	62.8319	314.159
5 7/8	18.4569	27.1085	13	40.8407	132.732	20 1/8	63.2246	318.099

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
20 1/8	63.6173	322.062	28 1/8	88.3573	621.262	36	113.097	1,017.876
20 1/4	64.0100	326.051	28 1/4	88.7500	626.797	36 1/8	113.490	1,024.957
20 3/8	64.4026	330.064	28 3/8	89.1427	632.356	36 1/4	113.883	1,032.062
20 1/2	64.7953	334.101	28 1/2	89.5354	637.940	36 3/8	114.275	1,039.192
20 5/8	65.1880	338.163	28 5/8	89.9281	643.548	36 1/2	114.668	1,046.347
20 3/4	65.5807	342.250	28 3/4	90.3208	649.181	36 5/8	115.061	1,053.526
21	65.9734	346.361	28 7/8	90.7135	654.838	36 3/4	115.454	1,060.729
21 1/8	66.3661	350.496	29	91.1062	660.520	36 7/8	115.846	1,067.957
21 1/4	66.7588	354.656	29 1/8	91.4989	666.226	37	116.239	1,075.210
21 3/8	67.1515	358.841	29 1/4	91.8916	671.957	37 1/8	116.632	1,082.487
21 1/2	67.5442	363.050	29 3/8	92.2843	677.713	37 1/4	117.024	1,089.789
21 5/8	67.9369	367.284	29 1/2	92.6770	683.493	37 3/8	117.417	1,097.115
21 3/4	68.3296	371.542	29 5/8	93.0697	689.297	37 1/2	117.810	1,104.466
21 7/8	68.7223	375.825	29 3/4	93.4624	695.126	37 5/8	118.202	1,111.842
22	69.1150	380.133	29 7/8	93.8551	700.980	37 3/4	118.595	1,119.241
22 1/8	69.5077	384.465	30	94.2478	706.858	37 7/8	118.988	1,126.666
22 1/4	69.9004	388.821	30 1/8	94.6405	712.761	38	119.381	1,134.115
22 3/8	70.2931	393.202	30 1/4	95.0332	718.688	38 1/8	119.773	1,141.589
22 1/2	70.6858	397.608	30 3/8	95.4259	724.640	38 1/4	120.166	1,149.087
22 5/8	71.0785	402.038	30 1/2	95.8186	730.617	38 3/8	120.559	1,156.609
22 3/4	71.4712	406.493	30 5/8	96.2113	736.618	38 1/2	120.951	1,164.156
22 7/8	71.8639	410.972	30 3/4	96.6040	742.643	38 5/8	121.344	1,171.728
23	72.2566	415.476	30 7/8	96.9967	748.693	38 3/4	121.737	1,179.324
23 1/8	72.6493	420.004	31	97.3894	754.768	38 7/8	122.129	1,186.945
23 1/4	73.0420	424.557	31 1/8	97.7821	760.867	39	122.522	1,194.591
23 3/8	73.4347	429.134	31 1/4	98.1748	766.990	39 1/8	122.915	1,202.261
23 1/2	73.8274	433.736	31 3/8	98.5675	773.139	39 1/4	123.308	1,209.955
23 5/8	74.2201	438.363	31 1/2	98.9602	779.311	39 3/8	123.700	1,217.674
23 3/4	74.6128	443.014	31 5/8	99.3529	785.509	39 1/2	124.093	1,225.417
23 7/8	75.0055	447.689	31 3/4	99.7456	791.730	39 5/8	124.486	1,233,186
24	75.3982	452.389	31 7/8	100.1383	797.977	39 3/4	124.878	1,240.978
24 1/8	75.7909	457.114	32	100.5310	804.248	39 7/8	125.271	1,248.795
24 1/4	76.1836	461.863	32 1/8	100.9237	810.543	40	125.664	1,256.637
24 3/8	76.5763	466.637	32 1/4	101.3164	816.863	40 1/8	126.056	1,264.503
24 1/2	76.9690	471.435	32 3/8	101.7091	823.208	40 1/4	126.449	1,272.394
24 5/8	77.3617	476.258	32 1/2	102.1018	829.577	40 3/8	126.842	1,280.309
24 3/4	77.7544	481.105	32 5/8	102.4945	835.970	40 1/2	127.235	1,288.249
24 7/8	78.1471	485.977	32 3/4	102.8872	842.389	40 5/8	127.627	1,296.214
25	78.5398	490.874	32 7/8	103.280	848.831	40 3/4	128.020	1,304.203
25 1/8	78.9325	495.795	33	103.673	855.299	40 7/8	128.413	1,312.216
25 1/4	79.3252	500.740	33 1/8	104.065	861.790	41	128.805	1,320.254
25 3/8	79.7179	505.711	33 1/4	104.458	868.307	41 1/8	129.198	1,328.317
25 1/2	80.1106	510.705	33 3/8	104.851	874.848	41 1/4	129.591	1,336.404
25 5/8	80.5033	515.724	33 1/2	105.243	881.413	41 3/8	129.983	1,344.516
25 3/4	80.8960	520.768	33 5/8	105.636	888.003	41 1/2	130.376	1,352.652
25 7/8	81.2887	525.836	33 3/4	106.029	894.618	41 5/8	130.769	1,360.813
26	81.6814	530.929	33 7/8	106.421	901.257	41 3/4	131.161	1,368.998
26 1/8	82.0741	536.047	34	106.814	907.920	41 7/8	131.554	1,377.208
26 1/4	82.4668	541.188	34 1/8	107.207	914.608	42	131.947	1,385.442
26 3/8	82.8595	546.355	34 1/4	107.600	921.321	42 1/8	132.340	1,393.701
26 1/2	83.2522	551.546	34 3/8	107.992	928.058	42 1/4	132.732	1,401.985
26 5/8	83.6449	556.761	34 1/2	108.385	934.820	42 3/8	133.125	1,410.293
26 3/4	84.0376	562.001	34 5/8	108.778	941.607	42 1/2	133.518	1,418.625
26 7/8	84.4303	567.266	34 3/4	109.170	948.417	42 5/8	133.910	1,426.983
27	84.8230	572.555	34 7/8	109.563	955.253	42 3/4	134.303	1,435.364
27 1/8	85.2157	577.869	35	109.956	962.113	42 7/8	134.696	1,443.770
27 1/4	85.6084	583.207	35 1/8	110.348	968.997	43	135.088	1,452.201
27 3/8	86.0011	588.570	35 1/4	110.741	975.906	43 1/8	135.481	1,460.657
27 1/2	86.3938	593.957	35 3/8	111.134	982.840	43 1/4	135.874	1,469.136
27 5/8	86.7865	599.369	35 1/2	111.527	989.798	43 3/8	136.267	1,477.641
27 3/4	87.1792	604.806	35 5/8	111.919	996.781	43 1/2	136.659	1,486.170
27 7/8	87.5719	610.267	35 3/4	112.312	1,003.788	43 5/8	137.052	1,494.723
28	87.9646	615.752	35 7/8	112.705	1,010.820	43 3/4	137.445	1,503.301

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
43 7/8	137.837	1,511.904	51 3/4	162.577	2,103.35	59 5/8	187.317	2,792.20
44	138.230	1,520.531	51 7/8	162.970	2,113.52	59 3/4	187.710	2,803.92
44 1/8	138.623	1,529.183	52	163.363	2,123.72	59 7/8	188.103	2,815.66
44 1/4	139.015	1,537.859	52 1/8	163.756	2,133.94	60	188.496	2,827.43
44 3/8	139.408	1,546.56	52 1/4	164.148	2,144.19	60 1/8	188.888	2,839.23
44 1/2	139.801	1,555.28	52 3/8	164.541	2,154.46	60 1/4	189.281	2,851.04
44 5/8	140.194	1,564.03	52 1/2	164.934	2,164.75	60 3/8	189.674	2,862.89
44 3/4	140.586	1,572.81	52 5/8	165.326	2,175.07	60 1/2	190.066	2,874.75
44 7/8	140.979	1,581.61	52 3/4	165.719	2,185.42	60 5/8	190.459	2,886.65
45	141.372	1,590.43	52 7/8	166.112	2,195.79	60 3/4	190.852	2,898.56
45 1/8	141.764	1,599.28	53	166.504	2,206.18	60 7/8	191.244	2,910.50
45 1/4	142.157	1,608.15	53 1/8	166.897	2,216.60	61	191.637	2,922.47
45 3/8	142.550	1,617.05	53 1/4	167.290	2,227.05	61 1/8	192.030	2,934.46
45 1/2	142.942	1,625.97	53 3/8	167.683	2,237.51	61 1/4	192.423	2,946.47
45 5/8	143.335	1,634.92	53 1/2	168.075	2,248.01	61 3/8	192.815	2,958.51
45 3/4	143.728	1,643.89	53 5/8	168.468	2,258.52	61 1/2	193.208	2,970.57
45 7/8	144.121	1,652.88	53 3/4	168.861	2,269.06	61 5/8	193.601	2,982.66
46	144.513	1,661.90	53 7/8	169.253	2,279.63	61 3/4	193.993	2,994.77
46 1/8	144.906	1,670.95	54	169.646	2,290.22	61 7/8	194.386	3,006.91
46 1/4	145.299	1,680.02	54 1/8	170.039	2,300.84	62	194.779	3,019.07
46 3/8	145.691	1,689.11	54 1/4	170.431	2,311.48	62 1/8	195.171	3,031.26
46 1/2	146.084	1,698.23	54 3/8	170.824	2,322.14	62 1/4	195.564	3,043.47
46 5/8	146.477	1,707.37	54 1/2	171.217	2,332.83	62 3/8	195.957	3,055.70
46 3/4	146.869	1,716.54	54 5/8	171.609	2,343.54	62 1/2	196.350	3,067.96
46 7/8	147.262	1,725.73	54 3/4	172.002	2,354.28	62 5/8	196.742	3,080.25
47	147.655	1,734.94	54 7/8	172.395	2,365.04	62 3/4	197.135	3,092.55
47 1/8	148.048	1,744.19	55	172.788	2,375.83	62 7/8	197.528	3,104.89
47 1/4	148.440	1,753.45	55 1/8	173.180	2,386.64	63	197.920	3,117.25
47 3/8	148.833	1,762.74	55 1/4	173.573	2,397.48	63 1/8	198.313	3,129.63
47 1/2	149.226	1,772.05	55 3/8	173.966	2,408.34	63 1/4	198.706	3,142.03
47 5/8	149.618	1,781.39	55 1/2	174.358	2,419.22	63 3/8	199.098	3,154.47
47 3/4	150.011	1,790.76	55 5/8	174.751	2,430.13	63 1/2	199.491	3,166.92
47 7/8	150.404	1,800.14	55 3/4	175.144	2,441.07	63 5/8	199.884	3,179.40
48	150.796	1,809.56	55 7/8	175.536	2,452.03	63 3/4	200.277	3,191.91
48 1/8	151.189	1,818.99	56	175.929	2,463.01	63 7/8	200.669	3,204.44
48 1/4	151.582	1,828.46	56 1/8	176.322	2,474.02	64	201.062	3,216.99
48 3/8	151.975	1,837.94	56 1/4	176.715	2,485.05	64 1/8	201.455	3,229.57
48 1/2	152.367	1,847.45	56 3/8	177.107	2,496.11	64 1/4	201.847	3,242.17
48 5/8	152.760	1,856.99	56 1/2	177.500	2,507.19	64 3/8	202.240	3,254.80
48 3/4	153.153	1,866.55	56 5/8	177.893	2,518.29	64 1/2	202.633	3,267.45
48 7/8	153.545	1,876.13	56 3/4	178.285	2,529.42	64 5/8	203.025	3,280.13
49	153.938	1,885.74	56 7/8	178.678	2,540.58	64 3/4	203.418	3,292.83
49 1/8	154.331	1,895.37	57	179.071	2,551.76	64 7/8	203.811	3,305.56
49 1/4	154.723	1,905.03	57 1/8	179.463	2,562.96	65	204.204	3,318.31
49 3/8	155.116	1,914.71	57 1/4	179.856	2,574.19	65 1/8	204.596	3,331.08
49 1/2	155.509	1,924.42	57 3/8	180.249	2,585.44	65 1/4	204.989	3,343.88
49 5/8	155.902	1,934.15	57 1/2	180.642	2,596.72	65 3/8	205.382	3,356.71
49 3/4	156.294	1,943.91	57 5/8	181.034	2,608.03	65 1/2	205.774	3,369.55
49 7/8	156.687	1,953.69	57 3/4	181.427	2,619.35	65 5/8	206.167	3,382.43
50	157.080	1,963.50	57 7/8	181.820	2,630.70	65 3/4	206.560	3,395.33
50 1/8	157.472	1,973.33	58	182.212	2,642.08	65 7/8	206.952	3,408.25
50 1/4	157.865	1,983.18	58 1/8	182.605	2,653.48	66	207.345	3,421.19
50 3/8	158.258	1,993.06	58 1/4	182.998	2,664.91	66 1/8	207.738	3,434.17
50 1/2	158.650	2,002.96	58 3/8	183.390	2,676.35	66 1/4	208.131	3,447.16
50 5/8	159.043	2,012.89	58 1/2	183.784	2,687.83	66 3/8	208.523	3,460.18
50 3/4	159.436	2,022.84	58 5/8	184.176	2,699.33	66 1/2	208.916	3,473.23
50 7/8	159.829	2,032.82	58 3/4	184.569	2,710.85	66 5/8	209.309	3,486.30
51	160.221	2,042.82	58 7/8	184.961	2,722.40	66 3/4	209.701	3,499.39
51 1/8	160.614	2,052.85	59	185.354	2,733.97	66 7/8	210.094	3,512.51
51 1/4	161.007	2,062.90	59 1/8	185.747	2,745.57	67	210.487	3,525.65
51 3/8	161.399	2,072.97	59 1/4	186.139	2,757.19	67 1/8	210.879	3,538.82
51 1/2	161.792	2,083.07	59 3/8	186.532	2,768.84	67 1/4	211.272	3,552.01
51 5/8	162.185	2,093.20	59 1/2	186.925	2,780.51	67 3/8	211.665	3,565.23

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
67 1/8	212.058	3,578.47	75 3/8	236.798	4,462.15	83 1/4	261.538	5,443.25
67 1/4	212.450	3,591.74	75 1/2	237.190	4,476.97	83 3/8	261.930	5,459.61
67 3/8	212.843	3,605.03	75 5/8	237.583	4,491.80	83 1/2	262.323	5,475.99
67 1/2	213.236	3,618.34	75 3/4	237.976	4,506.66	83 5/8	262.716	5,492.40
67 5/8	213.628	3,631.68	75 7/8	238.368	4,521.55	83 3/4	263.108	5,508.83
67 3/4	214.021	3,645.05	76	238.761	4,536.46	83 7/8	263.501	5,525.29
67 7/8	214.414	3,658.43	76 1/8	239.154	4,551.39	84	263.894	5,541.77
68	214.806	3,671.85	76 1/4	239.546	4,566.35	84 1/8	264.286	5,558.28
68 1/8	215.199	3,685.28	76 3/8	239.939	4,581.34	84 1/4	264.679	5,574.81
68 1/4	215.592	3,698.75	76 1/2	240.332	4,596.35	84 3/8	265.072	5,591.36
68 3/8	215.984	3,712.23	76 5/8	240.725	4,611.38	84 1/2	265.465	5,607.94
68 1/2	216.377	3,725.74	76 3/4	241.117	4,626.44	84 5/8	265.857	5,624.54
68 5/8	216.770	3,739.28	76 7/8	241.510	4,641.52	84 3/4	266.250	5,641.17
68 3/4	217.163	3,752.84	77	241.903	4,656.63	84 7/8	266.643	6,657.82
68 7/8	217.555	3,766.43	77 1/8	242.295	4,671.76	85	267.035	5,674.50
69	217.948	3,780.04	77 1/4	242.688	4,686.91	85 1/8	267.428	5,691.20
69 1/8	218.341	3,793.67	77 3/8	243.081	4,702.09	85 1/4	267.821	5,707.93
69 1/4	218.733	3,807.33	77 1/2	243.473	4,717.30	85 3/8	268.213	5,724.68
69 3/8	219.126	3,821.01	77 5/8	243.866	4,732.53	85 1/2	268.606	5,741.46
69 1/2	219.519	3,834.72	77 3/4	244.259	4,747.78	85 5/8	268.999	5,758.26
70	219.911	3,848.45	77 7/8	244.652	4,763.06	85 3/4	269.392	5,775.08
70 1/8	220.304	3,862.21	78	245.044	4,778.36	85 7/8	269.784	5,791.93
70 1/4	220.697	3,875.99	78 1/8	245.437	4,793.69	86	270.177	5,808.80
70 3/8	221.090	3,889.79	78 1/4	245.830	4,809.04	86 1/8	270.570	5,825.70
70 1/2	221.482	3,903.63	78 3/8	246.222	4,824.42	86 1/4	270.962	5,842.63
70 5/8	221.875	3,917.48	78 1/2	246.615	4,839.82	86 3/8	271.355	5,859.57
70 3/4	222.268	3,931.36	78 5/8	247.008	4,855.25	86 1/2	271.748	5,876.55
70 7/8	222.660	3,945.26	78 3/4	247.400	4,870.70	86 5/8	272.140	5,893.54
71	223.053	3,959.19	78 7/8	247.793	4,886.17	86 3/4	272.533	5,910.56
71 1/8	223.446	3,973.15	79	248.186	4,901.67	86 7/8	272.926	5,927.61
71 1/4	223.838	3,987.12	79 1/8	248.579	4,917.19	87	273.319	5,944.68
71 3/8	224.231	4,001.13	79 1/4	248.971	4,932.74	87 1/8	273.711	5,961.77
71 1/2	224.624	4,015.15	79 3/8	249.364	4,948.32	87 1/4	274.104	5,978.89
71 5/8	225.017	4,029.20	79 1/2	249.757	4,963.91	87 3/8	274.497	5,996.04
71 3/4	225.409	4,043.28	79 5/8	250.149	4,979.53	87 1/2	274.889	6,013.20
71 7/8	225.802	4,057.38	79 3/4	250.542	4,995.18	87 5/8	275.282	6,030.40
72	226.195	4,071.50	79 7/8	250.935	5,010.85	87 3/4	275.675	6,047.62
72 1/8	226.587	4,085.65	80	251.327	5,026.55	87 7/8	276.067	6,064.86
72 1/4	226.980	4,099.83	80 1/8	251.720	5,042.27	88	276.460	6,082.12
72 3/8	227.373	4,114.03	80 1/4	252.113	5,058.01	88 1/8	276.853	6,099.41
72 1/2	227.765	4,128.25	80 3/8	252.506	5,073.78	88 1/4	277.246	6,116.73
72 5/8	228.158	4,142.50	80 1/2	252.898	5,089.58	88 3/8	277.638	6,134.07
72 3/4	228.551	4,156.77	80 5/8	253.291	5,105.39	88 1/2	278.031	6,151.43
72 7/8	228.944	4,171.07	80 3/4	253.684	5,121.24	88 5/8	278.424	6,168.82
73	229.336	4,185.39	80 7/8	254.076	5,137.11	88 3/4	278.816	6,186.24
73 1/8	229.729	4,199.73	81	254.469	5,153.00	88 7/8	279.209	6,203.68
73 1/4	230.122	4,214.10	81 1/8	254.862	5,168.91	89	279.602	6,221.14
73 3/8	230.514	4,228.50	81 1/4	255.254	5,184.86	89 1/8	279.994	6,238.63
73 1/2	230.907	4,242.92	81 3/8	255.647	5,200.82	89 1/4	280.387	6,256.14
73 5/8	231.300	4,257.36	81 1/2	256.040	5,216.81	89 3/8	280.780	6,273.67
73 3/4	231.692	4,271.83	81 5/8	256.433	5,232.83	89 1/2	281.173	6,291.24
73 7/8	232.085	4,286.32	81 3/4	256.825	5,248.87	89 5/8	281.565	6,308.82
74	232.478	4,300.84	81 7/8	257.218	5,264.93	89 3/4	281.958	6,326.43
74 1/8	232.871	4,315.38	82	257.611	5,281.02	89 7/8	282.351	6,344.07
74 1/4	233.263	4,329.95	82 1/8	258.003	5,297.13	90	282.743	6,361.73
74 3/8	233.656	4,344.54	82 1/4	258.396	5,313.27	90 1/8	283.136	6,379.41
74 1/2	234.049	4,359.16	82 3/8	258.789	5,329.43	90 1/4	283.529	6,397.12
74 5/8	234.441	4,373.80	82 1/2	259.181	5,345.62	90 3/8	283.921	6,414.85
74 3/4	234.834	4,388.46	82 5/8	259.574	5,361.83	90 1/2	284.314	6,432.61
74 7/8	235.227	4,403.15	82 3/4	259.967	5,378.06	90 5/8	284.707	6,450.39
75	235.619	4,417.86	82 7/8	260.359	5,394.32	90 3/4	285.100	6,468.20
75 1/8	236.012	4,432.60	83	260.752	5,410.61	90 7/8	285.493	6,486.03
75 1/4	236.405	4,447.37	83 1/8	261.145	5,426.92	91	285.885	6,503.88

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
91 1/8	286.278	6,521.76	94 1/8	295.702	6,958.25	97 1/8	305.127	7,408.87
91 1/4	286.670	6,539.67	94 1/4	296.095	6,976.74	97 1/4	305.520	7,427.95
91 3/8	287.063	6,557.60	94 3/8	296.488	6,995.26	97 3/8	305.913	7,447.06
91 1/2	287.456	6,575.55	94 1/2	296.881	7,013.80	97 1/2	306.305	7,466.19
91 5/8	287.848	6,593.53	94 5/8	297.273	7,032.37	96 5/8	306.698	7,485.35
91 3/4	288.241	6,611.53	94 3/4	297.666	7,050.96	97 3/4	307.091	7,504.53
91 7/8	288.634	6,629.56	94 7/8	298.059	7,069.58	97 7/8	307.483	7,523.73
92	289.027	6,647.61	95	298.451	7,088.22	98	307.876	7,542.96
92 1/8	289.419	6,665.69	95 1/8	298.844	7,106.88	98 1/8	308.269	7,562.22
92 1/4	289.812	6,683.79	95 1/4	299.237	7,125.57	98 1/4	308.661	7,581.50
92 3/8	290.205	6,701.91	95 3/8	299.629	7,144.29	98 3/8	309.054	7,600.80
92 1/2	290.597	6,720.06	95 1/2	300.022	7,163.03	98 1/2	309.447	7,620.13
92 5/8	290.990	6,738.24	95 5/8	300.415	7,181.79	98 5/8	309.840	7,639.48
92 3/4	291.383	6,756.44	95 3/4	300.807	7,200.58	98 3/4	310.232	7,658.86
92 7/8	291.775	6,774.66	95 7/8	301.200	7,219.39	98 7/8	310.625	7,678.26
93	292.168	6,792.91	96	301.593	7,238.23	99	311.018	7,697.69
93 1/8	292.561	6,811.18	96 1/8	301.986	7,257.09	99 1/8	311.410	7,717.14
93 1/4	292.954	6,829.48	96 1/4	302.378	7,275.98	99 1/4	311.803	7,736.61
93 3/8	293.346	6,847.80	96 3/8	302.771	7,294.89	99 3/8	312.196	7,756.11
93 1/2	293.739	6,866.15	96 1/2	303.164	7,313.82	99 1/2	312.588	7,775.64
93 5/8	294.132	6,884.52	96 5/8	303.556	7,332.78	99 5/8	312.981	7,795.19
93 3/4	294.524	6,902.91	96 3/4	303.949	7,351.77	99 3/4	313.374	7,814.76
93 7/8	294.917	6,921.33	96 7/8	304.342	7,370.78	99 7/8	313.767	7,834.36
94	295.310	6,939.78	97	304.734	7,389.81	100	314.159	7,853.98

The preceding table may be used to determine the diameter when the circumference or area is known. Thus, the diameter of a circle having an area of 7,200 sq. in. is approximately 95 1/4 in.

Decimal Equivalents

1/64	.015625
1/32	.03125
3/64	.046875
1/16	.0625
5/64	.078125
3/32	.09375
7/64	.109375
1/8	.125
9/64	.140625
5/32	.15625
11/64	.171875
3/16	.1875
13/64	.203125
7/32	.21875
15/64	.234375
1/4	.25
17/64	.265625
9/32	.28125
19/64	.296875
5/16	.3125
21/64	.328125
11/32	.34375
23/64	.359375
3/8	.375
25/64	.390625
13/32	.40625
27/64	.421875
7/16	.4375
29/64	.453125
15/32	.46875
31/64	.484375
1/2	.5

33/64	.515625
17/32	.53125
35/64	.546875
9/16	.5625
37/64	.578125
19/32	.59375
39/64	.609375
5/8	.625
41/64	.640625
21/32	.65625
43/64	.671875
11/16	.6875
45/64	.703125
23/32	.71875
47/64	.734375
3/4	.75
49/64	.765625
25/32	.78125
51/64	.796875
13/16	.8125
53/64	.828125
27/32	.84375
55/64	.859375
7/8	.875
57/64	.890625
29/32	.90625
59/64	.921875
15/16	.9375
61/64	.953125
31/32	.96875
63/64	.984375
1	1.

No. 100 Log. 000 — TABLE IV — No. 109 Log. 040

N.	0	1	2	3	4	5	6	7	8	9	Diff.
100	00 0000	0434	0868	1301	1734	2166	2598	3029	3461	3891	432
1	4321	4751	5181	5609	6038	6466	6894	7321	7748	8174	428
2	8600	9026	9451	9876	0300	0724	1147	1570	1993	2415	424
3	01 2837	3259	3680	4100	4521	4940	5360	5779	6197	6616	420
4	7033	7451	7868	8284	8700	9116	9532	9947	0361	0775	416
105	02 1189	1603	2016	2428	2841	3252	3664	4075	4486	4896	412
6	5306	5715	6125	6533	6942	7350	7757	8164	8571	8978	408
7	9384	9789	0195	0600	1004	1408	1812	2216	2619	3021	404
8	03 3424	3826	4227	4628	5029	5430	5830	6230	6629	7028	400
9	7426	7825	8223	8620	9017	9414	9811	0207	0602	0998	397
	04										

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
434	43.4	86.8	130.2	173.6	217.0	260.4	303.8	347.2	390.6
433	43.3	86.6	129.9	173.2	216.5	259.8	303.1	346.4	389.7
432	43.2	86.4	129.6	172.8	216.0	259.2	302.4	345.6	388.8
431	43.1	86.2	129.3	172.4	215.5	258.6	301.7	344.8	387.9
430	43.0	86.0	129.0	172.0	215.0	258.0	301.0	344.0	387.0
429	42.9	85.8	128.7	171.6	214.5	257.4	300.3	343.2	386.1
428	42.8	85.6	128.4	171.2	214.0	256.8	299.6	342.4	385.2
427	42.7	85.4	128.1	170.8	213.5	256.2	298.9	341.6	384.3
426	42.6	85.2	127.8	170.4	213.0	255.6	298.2	340.8	383.4
425	42.5	85.0	127.5	170.0	212.5	255.0	297.5	340.0	382.5
424	42.4	84.8	127.2	169.6	212.0	254.4	296.8	339.2	381.6
423	42.3	84.6	126.9	169.2	211.5	253.8	296.1	338.4	380.7
422	42.2	84.4	126.6	168.8	211.0	253.2	295.4	337.6	379.8
421	42.1	84.2	126.3	168.4	210.5	252.6	294.7	336.8	378.9
420	42.0	84.0	126.0	168.0	210.0	252.0	294.0	336.0	378.0
419	41.9	83.8	125.7	167.6	209.5	251.4	293.3	335.2	377.1
418	41.8	83.6	125.4	167.2	209.0	250.8	292.6	334.4	376.2
417	41.7	83.4	125.1	166.8	208.5	250.2	291.9	333.6	375.3
416	41.6	83.2	124 8	166.4	208.0	249.6	291.2	332.8	374.4
415	41.5	83.0	124.5	166.0	207.5	249.0	290.5	332.0	373.5
414	41.4	82.8	124.2	165.6	207.0	248.4	289.8	331.2	372.6
413	41.3	82.6	123.9	165.2	206.5	247.8	289.1	330.4	371.7
412	41.2	82.4	123.6	164.8	206.0	247.2	288.4	329.6	370.8
411	41.1	82.2	123.3	164.4	205.5	246.6	287.7	328.8	369.9
410	41.0	82.0	123.0	164.0	205.0	246.0	287.0	328.0	369.0
409	40.9	81.8	122.7	163.6	204.5	245.4	286.3	327.2	368.1
408	40.8	81.6	122.4	163.2	204.0	244.8	285.6	326.4	367.2
407	40.7	81.4	122.1	162.8	203.5	244.2	284.9	325.6	366.3
406	40.6	81.2	121.8	162.4	203.0	243.6	284.2	324.8	365.4
405	40.5	81.0	121.5	162.0	202.5	243.0	283.5	324.0	364.5
404	40.4	80.8	121.2	161.6	202.0	242.4	282.8	323.2	363.6
403	40.3	80.6	120.9	161.2	201.5	241.8	282.1	322.4	362.7
402	40.2	80.4	120.6	160.8	201.0	241.2	281.4	321.6	361.8
401	40.1	80.2	120.3	160.4	200.5	240.6	280.7	320.8	360.9
400	40.0	80.0	120.0	160.0	200.0	240.0	280.0	320.0	360.0
399	39.9	79.8	119.7	159.6	199.5	239.4	279.3	319.2	359.1
398	39.8	79.6	119.4	159.2	199.0	238.8	278.6	318.4	358.2
397	39.7	79.4	119.1	158.8	198.5	238.2	277.9	317.6	357.3
396	39.6	79.2	118.8	158.4	198.0	237.6	277.2	316.8	356.4
395	39.5	79.0	118.5	158.0	197.5	237.0	276.5	316.0	351.6

No. 110
Log. 041

No. 119
Log. 078

N.	0	1	2	3	4	5	6	7	8	9	Diff.
110	04 1393	1787	2182	2576	2969	3362	3755	4148	4540	4932	393
1	5323	5714	6105	6495	6885	7275	7664	8053	8442	8830	390
2	9218	9606	9993	0380	0766	1153	1538	1924	2309	2694	386
3	05 3078	3463	3846	4230	4613	4996	5378	5760	6142	6524	383
4	6905	7286	7666	8046	8426	8805	9185	9563	9942	0320	379
115	06 0698	1075	1452	1829	2206	2582	2958	3333	3709	4083	376
6	4458	4832	5206	5580	5953	6326	6699	7071	7443	7815	373
7	8186	8557	8928	9298	9668	0038	0407	0776	1145	1514	370
8	07 1882	2250	2617	2985	3352	3718	4085	4451	4816	5182	366
9	5547	5912	6276	6640	7004	7368	7731	8094	8457	8819	363

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
395	39.5	79.0	118.5	158.0	197.5	237.0	276.5	316.0	355.5
394	39.4	78.8	118.2	157.6	197.0	236.4	275.8	315.2	354.6
393	39.3	78.6	117.9	157.2	196.5	235.8	275.1	314.4	353.7
392	39.2	78.4	117.6	156.8	196.0	235.2	274.4	313.6	352.8
391	39.1	78.2	117.3	156.4	195.5	234.6	273.7	312.8	351.9
390	39.0	78.0	117.0	156.0	195.0	234.0	273.0	312.0	351.0
389	38.9	77.8	116.7	155.6	194.5	233.4	272.3	311.2	350.1
388	38.8	77.6	116.4	155.2	194.0	232.8	271.6	310.4	349.2
387	38.7	77.4	116.1	154.8	193.5	232.2	270.9	309.6	348.3
386	38.6	77.2	115.8	154.4	193.0	231.6	270.2	308.8	347.4
385	38.5	77.0	115.5	154.0	192.5	231.0	269.5	308.0	346.5
384	38.4	76.8	115.2	153.6	192.0	230.4	268.8	307.2	345.6
383	38.3	76.6	114.9	153.2	191.5	229.8	268.1	306.4	344.7
382	38.2	76.4	114.6	152.8	191.0	229.2	267.4	305.6	343.8
381	38.1	76.2	114.3	152.4	190.5	228.6	266.7	304.8	342.9
380	38.0	76.0	114.0	152.0	190.0	228.0	266.0	304.0	342.0
379	37.9	75.8	113.7	151.6	189.5	227.4	265.3	303.2	341.1
378	37.8	75.6	113.4	151.2	189.0	226.8	264.6	302.4	340.2
377	37.7	75.4	113.1	150.8	188.5	226.2	263.9	301.6	339.3
376	37.6	75.2	112.8	150.4	188.0	225.6	263.2	300.8	338.4
375	37.5	75.0	112.5	150.0	187.5	225.0	262.5	300.0	337.5
374	37.4	74.8	112.2	149.6	187.0	224.4	261.8	299.2	336.6
373	37.3	74.6	111.9	149.2	186.5	223.8	261.1	298.4	335.7
372	37.2	74.4	111.6	148.8	186.0	223.2	260.4	297.6	334.8
371	37.1	74.2	111.3	148.4	185.5	222.6	259.7	296.8	333.9
370	37.0	74.0	111.0	148.0	185.0	222.0	259.0	296.0	333.0
369	36.9	73.8	110.7	147.6	184.5	221.4	258.3	295.2	332.1
368	36.8	73.6	110.4	147.2	184.0	220.8	257.6	294.4	331.2
367	36.7	73.4	110.1	146.8	183.5	220.2	256.9	293.6	330.3
366	36.6	73.2	109.8	146.4	183.0	219.6	256.2	292.8	329.4
365	36.5	73.0	109.5	146.0	182.5	219.0	255.7	292.0	328.5
364	36.4	72.8	109.2	145.6	182.0	218.4	254.8	291.2	327.6
363	36.3	72.6	108.9	145.2	181.5	217.8	254.1	290.4	326.7
362	36.2	72.4	108.6	144.8	181.0	217.2	253.4	289.6	325.8
361	36.1	72.2	108.3	144.4	180.5	216.6	252.7	288.8	324.9
360	36.0	72.0	108.0	144.0	180.0	216.0	252.0	288.0	324.0
359	35.9	71.8	107.7	143.6	179.5	215.4	251.3	287.2	323.1
358	35.8	71.6	107.4	143.2	179.0	214.8	250.6	286.4	322.2
357	35.7	71.4	107.1	142.8	178.5	214.2	249.9	285.6	321.3
356	35.6	71.2	106.8	142.4	178.0	213.6	249.2	284.8	320.4

No. 120
Log. 079

No. 134
Log. 130

N.	0	1	2	3	4	5	6	7	8	9	Diff.
120	07 9181	9543	9904	0266	0626	0987	1347	1707	2067	2426	360
1	08 2785	3144	3503	3861	4219	4576	4934	5291	5647	6004	357
2	6360	6716	7071	7426	7781	8136	8490	8845	9198	9552	355
3	9905	0258	0611	0963	1315	1667	2018	2370	2721	3071	352
4	09 3422	3772	4122	4471	4820	5169	5518	5866	6215	6562	349
125	6910	7257	7604	7951	8298	8644	8990	9335	9681	0026	346
6	10 0371	0715	1059	1403	1747	2091	2434	2777	3119	3462	343
7	3804	4146	4487	4828	5169	5510	5851	6191	6531	6871	341
8	7210	7549	7888	8227	8565	8903	9241	9579	9916	0253	338
9	11 0590	0926	1263	1599	1934	2270	2605	2940	3275	3609	335
130	3943	4277	4611	4944	5278	5611	5943	6276	6608	6940	333
1	7271	7603	7934	8265	8595	8926	9256	9586	9915	0245	330
2	12 0574	0903	1231	1560	1888	2216	2544	2871	3198	3525	328
3	3852	4178	4504	4830	5156	5481	5806	6131	6456	6781	325
4	7105	7429	7753	8076	8399	8722	9045	9368	9690	0012	323
	13										

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
355	35.5	71.0	106.5	142.0	177.5	213.0	248.5	284.0	319.5
354	35.4	70.8	106.2	141.6	177.0	212.4	247.8	283.2	318.6
353	35.3	70.6	105.9	141.2	176.5	211.8	247.1	282.4	317.7
352	35.2	70.4	105.6	140.8	176.0	211.2	246.4	281.6	316.8
351	35.1	70.2	105.3	140.4	175.5	210.6	245.7	280.8	315.9
350	35.0	70.0	105.0	140.0	175.0	210.0	245.0	280.0	315.0
349	34.9	69.8	104.7	139.6	174.5	209.4	244.3	279.2	314.1
348	34.8	69.6	104.4	139.2	174.0	208.8	243.6	278.4	313.2
347	34.7	69.4	104.1	138.8	173.5	208.2	242.9	277.6	312.3
346	34.6	69.2	103.8	138.4	173.0	207.6	242.2	276.8	311.4
345	34.5	69.0	103.5	138.0	172.5	207.0	241.5	276.0	310.5
344	34.4	68.8	103.2	137.6	172.0	206.4	240.8	275.2	309.6
343	34.3	68.6	102.9	137.2	171.5	205.8	240.1	274.4	308.7
342	34.2	68.4	102.6	136.8	171.0	205.2	239.4	273.6	307.8
341	34.1	68.2	102.3	136.4	170.5	204.6	238.7	272.8	306.9
340	34.0	68.0	102.0	136.0	170.0	204.0	238.0	272.0	306.0
339	33.9	67.8	101.7	135.6	169.5	203.4	237.3	271.2	305.1
338	33.8	67.6	101.4	135.2	169.0	202.8	236.6	270.4	304.2
337	33.7	67.4	101.1	134.8	168.5	202.2	235.9	269.6	303.3
336	33.6	67.2	100.8	134.4	168.0	201.6	235.2	268.8	302.4
335	33.5	67.0	100.5	134.0	167.5	201.0	234.5	268.0	301.5
334	33.4	66.8	100.2	133.6	167.0	200.4	233.8	267.2	300.6
333	33.3	66.6	99.9	133.2	166.5	199.8	233.1	266.4	299.7
332	33.2	66.4	99.6	132.8	166.0	199.2	232.4	265.6	298.8
331	33.1	66.2	99.3	132.4	165.5	198.6	231.7	264.8	297.9
330	33.0	66.0	99.0	132.0	165.0	198.0	231.0	264.0	297.0
329	32.9	65.8	98.7	131.6	164.5	197.4	230.3	263.2	296.1
328	32.8	65.6	98.4	131.2	164.0	196.8	229.6	262.4	295.2
327	32.7	65.4	98.1	130.8	163.5	196.2	228.9	261.6	294.3
326	32.6	65.2	97.8	130.4	163.0	195.6	228.2	260.8	293.4
325	32.5	65.0	97.5	130.0	162.5	195.0	227.5	260.0	292.5
324	32.4	64.8	97.2	129.6	162.0	194.4	226.8	259.2	291.6
323	32.3	64.6	96.9	129.2	161.5	193.8	226.1	258.4	290.7
322	32.2	64.4	96.6	128.8	161.0	193.2	225.4	257.6	289.8

No. 135
Log. 130

No. 149
Log. 175

N.	0	1	2	3	4	5	6	7	8	9	Diff.
135	13 0334	0655	0977	1298	1619	1939	2260	2580	2900	3219	321
6	3539	3858	4177	4496	4814	5133	5451	5769	6086	6403	318
7	6721	7037	7354	7671	7987	8303	8618	8934	9249	9564	316
8	9879	0194	0508	0822	1136	1450	1763	2076	2389	2702	314
9	14 3015	3327	3639	3951	4263	4574	4885	5196	5507	5818	311
140	6128	6438	6748	7058	7367	7676	7985	8294	8603	8911	309
1	9219	9527	9835	0142	0449	0756	1063	1370	1676	1982	307
2	15 2288	2594	2900	3205	3510	3815	4120	4424	4728	5032	305
3	5336	5640	5943	6246	6549	6852	7154	7457	7759	8061	303
4	8362	8664	8965	9266	9567	9868	0168	0469	0769	1068	301
145	16 1368	1667	1967	2266	2564	2863	3161	3460	3758	4055	299
6	4353	4650	4947	5244	5541	5838	6134	6430	6726	7022	297
7	7317	7613	7908	8203	8497	8792	9086	9380	9674	9968	295
8	17 0262	0555	0848	1141	1434	1726	2019	2311	2603	2895	293
9	3186	3478	3769	4060	4351	4641	4932	5222	5512	5802	291

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
321	32.1	64.2	96.3	128.4	160.5	192.6	224.7	256.8	288.9
320	32.0	64.0	96.0	128.0	160.0	192.0	224.0	256.0	288.0
319	31.9	63.8	95.7	127.6	159.5	191.4	223.3	255.2	287.1
318	31.8	63.6	95.4	127.2	159.0	190.8	222.6	254.4	286.2
317	31.7	63.4	95.1	126.8	158.5	190.2	221.9	253.6	285.3
316	31.6	63.2	94.8	126.4	158.0	189.6	221.2	252.8	284.4
315	31.5	63.0	94.5	126.0	157.5	189.0	220.5	252.0	283.5
314	31.4	62.8	94.2	125.6	157.0	188.4	219.8	251.2	282.6
313	31.3	62.6	93.9	125.2	156.5	187.8	219.1	250.4	281.7
312	31.2	62.4	93.6	124.8	156.0	187.2	218.4	249.6	280.8
311	31.1	62.2	93.3	124.4	155.5	186.6	217.7	248.8	279.9
310	31.0	62.0	93.0	124.0	155.0	186.0	217.0	248.0	279.0
309	30.9	61.8	92.7	123.6	154.5	185.4	216.3	247.2	278.1
308	30.8	61.6	92.4	123.2	154.0	184.8	215.6	246.4	277.2
307	30.7	61.4	92.1	122.8	153.5	184.2	214.9	245.6	276.3
306	30.6	61.2	91.8	122.4	153.0	183.6	214.2	244.8	275.4
305	30.5	61.0	91.5	122.0	152.5	183.0	213.5	244.0	274.5
304	30.4	60.8	91.2	121.6	152.0	182.4	212.8	243.2	273.6
303	30.3	60.6	90.9	121.2	151.5	181.8	212.1	242.4	272.7
302	30.2	60.4	90.6	120.8	151.0	181.2	211.4	241.6	271.8
301	30.1	60.2	90.3	120.4	150.5	180.6	210.7	240.8	270.9
300	30.0	60.0	90.0	120.0	150.0	180.0	210.0	240.0	270.0
299	29.9	59.8	89.7	119.6	149.5	179.4	209.3	239.2	269.1
298	29.8	59.6	89.4	119.2	149.0	178.8	208.6	238.4	268.2
297	29.7	59.4	89.1	118.8	148.5	178.2	207.9	237.6	267.3
296	29.6	59.2	88.8	118.4	148.0	177.6	207.2	236.8	266.4
295	29.5	59.0	88.5	118.0	147.5	177.0	206.5	236.0	265.5
294	29.4	58.8	88.2	117.6	147.0	176.4	205.8	235.2	264.6
293	29.3	58.6	87.9	117.2	146.5	175.8	205.1	234.4	263.7
292	29.2	58.4	87.6	116.8	146.0	175.2	204.4	233.6	262.8
291	29.1	58.2	87.3	116.4	145.5	174.6	203.7	232.8	261.9
290	29.0	58.0	87.0	116.0	145.0	174.0	203.0	232.0	261.0
289	28.9	57.8	86.7	115.6	144.5	173.4	202.3	231.2	260.1
288	28.8	57.6	86.4	115.2	144.0	172.8	201.6	230.4	259.2
287	28.7	57.4	86.1	114.8	143.5	172.2	200.9	229.6	258.3
286	28.6	57.2	85.8	114.4	143.0	171.6	200.2	228.8	257.4

No. 150
Log. 176

No. 169
Log. 230

N.	0	1	2	3	4	5	6	7	8	9	Diff.
150	17 6091	6381	6670	6959	7248	7536	7825	8113	8401	8689	289
1	8977	9264	9552	9839	0126	0413	0699	0986	1272	1558	287
2	18 1844	2129	2415	2700	2985	3270	3555	3839	4123	4407	285
3	4691	4975	5259	5542	5825	6108	6391	6674	6956	7239	283
4	7521	7803	8084	8366	8647	8928	9209	9490	9771	0051	281
155	19 0332	0612	0892	1171	1451	1730	2010	2289	2567	2846	279
6	3125	3403	3681	3959	4237	4514	4792	5069	5346	5623	278
7	5900	6176	6453	6729	7005	7281	7556	7832	8107	8382	276
8	8657	8932	9206	9481	9755	0029	0303	0577	0850	1124	274
9	20 1397	1670	1943	2216	2488	2761	3033	3305	3577	3848	272
160	4120	4391	4663	4934	5204	5475	5746	6016	6286	6556	271
1	6826	7096	7365	7634	7904	8173	8441	8710	8979	9247	269
2	9515	9783	0051	0319	0586	0853	1121	1388	1654	1921	267
3	21 2188	2454	2720	2986	3252	3518	3783	4049	4314	4579	266
4	4844	5109	5373	5638	5902	6166	6430	6694	6957	7221	264
165	7484	7747	8010	8273	8536	8798	9060	9323	9585	9846	262
6	22 0108	0370	0631	0892	1153	1414	1675	1936	2196	2456	261
7	2716	2976	3236	3496	3755	4015	4274	4533	4792	5051	259
8	5309	5568	5826	6084	6342	6600	6858	7115	7372	7630	258
9	7887	8144	8400	8657	8913	9170	9426	9682	9938	0193	256
	23										

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
285	28.5	57.0	85.5	114.0	142.5	171.0	199.5	228.0	256.5
284	28.4	56.8	85.2	113.6	142.0	170.4	198.8	227.2	255.6
283	28.3	56.6	84.9	113.2	141.5	169.8	198.1	226.4	254.7
282	28.2	56.4	84.6	112.8	141.0	169.2	197.4	225.6	253.8
281	28.1	56.2	84.3	112.4	140.5	168.6	196.7	224.8	252.9
280	28.0	56.0	84.0	112.0	140.0	168.0	196.0	224.0	252.0
279	27.9	55.8	83.7	111.6	139.5	167.4	195.3	223.2	251.1
278	27.8	55.6	83.4	111.2	139.0	166.8	194.6	222.4	250.2
277	27.7	55.4	83.1	110.8	138.5	166.2	193.9	221.6	249.3
276	27.6	55.2	82.8	110.4	138.0	165.6	193.2	220.8	248.4
275	27.5	55.0	82.5	110.0	137.5	165.0	192.5	220.0	247.5
274	27.4	54.8	82.2	109.6	137.0	164.4	191.8	219.2	246.6
273	27.3	54.6	81.9	109.2	136.5	163.8	191.1	218.4	245.7
272	27.2	54.4	81.6	108.8	136.0	163.2	190.4	217.6	244.8
271	27.1	54.2	81.3	108.4	135.5	162.6	189.7	216.8	243.9
270	27.0	54.0	81.0	108.0	135.0	162.0	189.0	216.0	243.0
269	26.9	53.8	80.7	107.6	134.5	161.4	188.3	215.2	242.1
268	26.8	53.6	80.4	107.2	134.0	160.8	187.6	214.4	241.2
267	26.7	53.4	80.1	106.8	133.5	160.2	186.9	213.6	240.3
266	26.6	53.2	79.8	106.4	133.0	159.6	186.2	212.8	239.4
265	26.5	53.0	79.5	106.0	132.5	159.0	185.5	212.0	238.5
264	26.4	52.8	79.2	105.6	132.0	158.4	184.8	211.2	237.6
263	26.3	52.6	78.9	105.2	131.5	157.8	184.1	210.4	236.7
262	26.2	52.4	78.6	104.8	131.0	157.2	183.4	209.6	235.8
261	26.1	52.2	78.3	104.4	130.5	156.6	182.7	208.8	234.9
260	26.0	52.0	78.0	104.0	130.0	156.0	182.0	208.0	234.0
259	25.9	51.8	77.7	103.6	129.5	155.4	181.3	207.2	233.1
258	25.8	51.6	77.4	103.2	129.0	154.8	180.6	206.4	232.2
257	25.7	51.4	77.1	102.8	128.5	154.2	179.9	205.6	231.3
256	25.6	51.2	76.8	102.4	128.0	153.6	179.2	204.8	230.4
255	25.5	51.0	76.5	102.0	127.5	153.0	178.5	204.0	229.5

No. 170
Log. 230

No. 189
Log. 278

N.	0	1	2	3	4	5	6	7	8	9	Diff.
170	23 0449	0704	0960	1215	1470	1724	1979	2234	2488	2742	255
1	2996	3250	3504	3757	4011	4264	4517	4770	5023	5276	253
2	5528	5781	6033	6285	6537	6789	7041	7292	7544	7795	252
3	8046	8297	8548	8799	9049	9299	9550	9800	0050	0300	250
4	24 0549	0799	1048	1297	1546	1795	2044	2293	2541	2790	249
175	3038	3286	3534	3782	4030	4277	4525	4772	5019	5266	248
6	5513	5759	6006	6252	6499	6745	6991	7237	7482	7728	246
7	7973	8219	8464	8709	8954	9198	9443	9687	9932	0176	245
8	25 0420	0664	0908	1151	1395	1638	1881	2125	2368	2610	243
9	2853	3096	3338	3580	3822	4064	4306	4548	4790	5031	242
180	5273	5514	5755	5996	6237	6477	6718	6958	7198	7439	241
1	7679	7918	8158	8398	8637	8877	9116	9355	9594	9833	239
2	26 0071	0310	0548	0787	1025	1263	1501	1739	1976	2214	238
3	2451	2688	2925	3162	3399	3636	3873	4109	4346	4582	237
4	4818	5054	5290	5525	5761	5996	6232	6467	6702	6937	235
185	7172	7406	7641	7875	8110	8344	8578	8812	9046	9279	234
6	9513	9746	9980	0213	0446	0679	0912	1144	1377	1609	233
7	27 1842	2074	2306	2538	2770	3001	3233	3464	3696	3927	232
8	4158	4389	4620	4850	5081	5311	5542	5772	6002	6232	230
9	6462	6692	6921	7151	7380	7609	7838	8067	8296	8525	229

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
255	25.5	51.0	76.5	102.0	127.5	153.0	178.5	204.0	229.5
254	25.4	50.8	76.2	101.6	127.0	152.4	177.8	203.2	228.6
253	25.3	50.6	75.9	101.2	126.5	151.8	177.1	202.4	227.7
252	25.2	50.4	75.6	100.8	126.0	151.2	176.4	201.6	226.8
251	25.1	50.2	75.3	100.4	125.5	150.6	175.7	200.8	225.9
250	25.0	50.0	75.0	100.0	125.0	150.0	175.0	200.0	225.0
249	24.9	49.8	74.7	99.6	124.5	149.4	174.3	199.2	224.1
248	24.8	49.6	74.4	99.2	124.0	148.8	173.6	198.4	223.2
247	24.7	49.4	74.1	98.8	123.5	148.2	172.9	197.6	222.3
246	24.6	49.2	73.8	98.4	123.0	147.6	172.2	196.8	221.4
245	24.5	49.0	73.5	98.0	122.5	147.0	171.5	196.0	220.5
244	24.4	48.8	73.2	97.6	122.0	146.4	170.8	195.2	219.6
243	24.3	48.6	72.9	97.2	121.5	145.8	170.1	194.4	218.7
242	24.2	48.4	72.6	96.8	121.0	145.2	169.4	193.6	217.8
241	24.1	48.2	72.3	96.4	120.5	144.6	168.7	192.8	216.9
240	24.0	48.0	72.0	96.0	120.0	144.0	168.0	192.0	216.0
239	23.9	47.8	71.7	95.6	119.5	143.4	167.3	191.2	215.1
238	23.8	47.6	71.4	95.2	119.0	142.8	166.6	190.4	214.2
237	23.7	47.4	71.1	94.8	118.5	142.2	165.9	189.6	213.3
236	23.6	47.2	70.8	94.4	118.0	141.6	165.2	188.8	212.4
235	23.5	47.0	70.5	94.0	117.5	141.0	164.5	188.0	211.5
234	23.4	46.8	70.2	93.6	117.0	140.4	163.8	187.2	210.6
233	23.3	46.6	69.9	93.2	116.5	139.8	163.1	186.4	209.7
232	23.2	46.4	69.6	92.8	116.0	139.2	162.4	185.6	208.8
231	23.1	46.2	69.3	92.4	115.5	138.6	161.7	184.8	207.9
230	23.0	46.0	69.0	92.0	115.0	138.0	161.0	184.0	207.0
229	22.9	45.8	68.7	91.6	114.5	137.4	160.3	183.2	206.1
228	22.8	45.6	68.4	91.2	114.0	136.8	159.6	182.4	205.2
227	22.7	45.4	68.1	90.8	113.5	136.2	158.9	181.6	204.3
226	22.6	45.2	67.8	90.4	113.0	135.6	158.2	180.8	203.4

No. 190
Log. 278

No. 214
Log. 332

N.	0	1	2	3	4	5	6	7	8	9	Diff.
190	27 8754	8982	9211	9439	9667	9895	0123	0351	0578	0806	228
1	28 1033	1261	1488	1715	1942	2169	2396	2622	2849	3075	227
2	3301	3527	3753	3979	4205	4431	4656	4882	5107	5332	226
3	5557	5782	6007	6232	6456	6681	6905	7130	7354	7578	225
4	7802	8026	8249	8473	8696	8920	9143	9366	9589	9812	223
195	29 0035	0257	0480	0702	0925	1147	1369	1591	1813	2034	222
6	2256	2478	2699	2920	3141	3363	3584	3804	4025	4246	221
7	4466	4687	4907	5127	5347	5567	5787	6007	6226	6446	220
8	6665	6884	7104	7323	7542	7761	7979	8198	8416	8635	219
9	8853	9071	9289	9507	9725	9943	0161	0378	0595	0813	218
200	30 1030	1247	1464	1681	1898	2114	2331	2547	2764	2980	217
1	3196	3412	3628	3844	4059	4275	4491	4706	4921	5136	216
2	5351	5566	5781	5996	6211	6425	6639	6854	7068	7282	215
3	7496	7710	7924	8137	8351	8564	8778	8991	9204	9417	213
4	9630	9843	0056	0268	0481	0693	0906	1118	1330	1542	212
205	31 1754	1966	2177	2389	2600	2812	3023	3234	3445	3656	211
6	3867	4078	4289	4499	4710	4920	5130	5340	5551	5760	210
7	5970	6180	6390	6599	6809	7018	7227	7436	7646	7854	209
8	8063	8272	8481	8689	8898	9106	9314	9522	9730	9938	208
9	32 0146	0354	0562	0769	0977	1184	1391	1598	1805	2012	207
210	2219	2426	2633	2839	3046	3252	3458	3665	3871	4077	206
1	4282	4488	4694	4899	5105	5310	5516	5721	5926	6131	205
2	6336	6541	6745	6950	7155	7359	7563	7767	7972	8176	204
3	8380	8583	8787	8991	9194	9398	9601	9805	0008	0211	203
4	33 0414	0617	0819	1022	1225	1427	1630	1832	2034	2236	202

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
225	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	202.5
224	22.4	44.8	67.2	89.6	112.0	134.4	156.8	179.2	201.6
223	22.3	44.6	66.9	89.2	111.5	133.8	156.1	178.4	200.7
222	22.2	44.4	66.6	88.8	111.0	133.2	155.4	177.6	199.8
221	22.1	44.2	66.3	88.4	110.5	132.6	154.7	176.8	198.9
220	22.0	44.0	66.0	88.0	110.0	132.0	154.0	176.0	198.0
219	21.9	43.8	65.7	87.6	109.5	131.4	153.3	175.2	197.1
218	21.8	43.6	65.4	87.2	109.0	130.8	152.6	174.4	196.2
217	21.7	43.4	65.1	86.8	108.5	130.2	151.9	173.6	195.3
216	21.6	43.2	64.8	86.4	108.0	129.6	151.2	172.8	194.4
215	21.5	43.0	64.5	86.0	107.5	129.0	150.5	172.0	193.5
214	21.4	42.8	64.2	85.6	107.0	128.4	149.8	171.2	192.6
213	21.3	42.6	63.9	85.2	106.5	127.8	149.1	170.4	191.7
212	21.2	42.4	63.6	84.8	106.0	127.2	148.4	169.6	190.8
211	21.1	42.2	63.3	84.4	105.5	126.6	147.7	168.8	189.9
210	21.0	42.0	63.0	84.0	105.0	126.0	147.0	168.0	189.0
209	20.9	41.8	62.7	83.6	104.5	125.4	146.3	167.2	188.1
208	20.8	41.6	62.4	83.2	104.0	124.8	145.6	166.4	187.2
207	20.7	41.4	62.1	82.8	103.5	124.2	144.9	165.6	186.3
206	20.6	41.2	61.8	82.4	103.0	123.6	144.2	164.8	185.4
205	20.5	41.0	61.5	82.0	102.5	123.0	143.5	164.0	184.5
204	20.4	40.8	61.2	81.6	102.0	122.4	142.8	163.2	183.6
203	20.3	40.6	60.9	81.2	101.5	121.8	142.1	162.4	182.7
202	20.2	40.4	60.6	80.8	101.0	121.2	141.4	161.6	181.8

No. 215
Log. 332

No. 239
Log. 380

N.	0	1	2	3	4	5	6	7	8	9	Diff.
215	33 2438	2640	2842	3044	3246	3447	3649	3850	4051	4253	202
6	4454	4655	4856	5057	5257	5458	5658	5859	6059	6260	201
7	6460	6660	6860	7060	7260	7459	7659	7858	8058	8257	200
8	8456	8656	8855	9054	9253	9451	9650	9849	0047	0246	199
9	34 0444	0642	0841	1039	1237	1435	1632	1830	2028	2225	198
220	2423	2620	2817	3014	3212	3409	3606	3802	3999	4196	197
1	4392	4589	4785	4981	5178	5374	5570	5766	5962	6157	196
2	6353	6549	6744	6939	7135	7330	7525	7720	7915	8110	195
3	8305	8500	8694	8889	9083	9278	9472	9666	9860	0054	194
4	35 0248	0442	0636	0829	1023	1216	1410	1603	1796	1989	193
225	2183	2375	2568	2761	2954	3147	3339	3532	3724	3916	193
6	4108	4301	4493	4685	4876	5068	5260	5452	5643	5834	192
7	6026	6217	6408	6599	6790	6981	7172	7363	7554	7744	191
8	7935	8125	8316	8506	8696	8886	9076	9266	9456	9646	190
9	9835	0025	0215	0404	0593	0783	0972	1161	1350	1539	189
230	36 1728	1917	2105	2294	2482	2671	2859	3048	3236	3424	188
1	3612	3800	3988	4176	4363	4551	4739	4926	5113	5301	188
2	5488	5675	5862	6049	6236	6423	6610	6796	6983	7169	187
3	7356	7542	7729	7915	8101	8287	8473	8659	8845	9030	186
4	9216	9401	9587	9772	9958	0143	0328	0513	0698	0883	185
235	37 1068	1253	1437	1622	1806	1991	2175	2360	2544	2728	184
6	2912	3096	3280	3464	3647	3831	4015	4198	4382	4565	184
7	4748	4932	5115	5298	5481	5664	5846	6029	6212	6394	183
8	6577	6759	6942	7124	7306	7488	7670	7852	8034	8216	182
9	8398	8580	8761	8943	9124	9306	9487	9668	9849	0030	181
	38										

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
202	20.2	40.4	60.6	80.8	101.0	121.2	141.4	161.6	181.8
201	20.1	40.2	60.3	80.4	100.5	120.6	140.7	160.8	180.9
200	20.0	40.0	60.0	80.0	100.0	120.0	140.0	160.0	180.0
199	19.9	39.8	59.7	79.6	99.5	119.4	139.3	159.2	179.1
198	19.8	39.6	59.4	79.2	99.0	118.8	138.6	158.4	178.2
197	19.7	39.4	59.1	78.8	98.5	118.2	137.9	157.6	177.3
196	19.6	39.2	58.8	78.4	98.0	117.6	137.2	156.8	176.4
195	19.5	39.0	58.5	78.0	97.5	117.0	136.5	156.0	175.5
194	19.4	38.8	58.2	77.6	97.0	116.4	135.8	155.2	174.6
193	19.3	38.6	57.9	77.2	96.5	115.8	135.1	154.4	173.7
192	19.2	38.4	57.6	76.8	96.0	115.2	134.4	153.6	172.8
191	19.1	38.2	57.3	76.4	95.5	114.6	133.7	152.8	171.9
190	19.0	38.0	57.0	76.0	95.0	114.0	133.0	152.0	171.0
189	18.9	37.8	56.7	75.6	94.5	113.4	132.3	151.2	170.1
188	18.8	37.6	56.4	75.2	94.0	112.8	131.6	150.4	169.2
187	18.7	37.4	56.1	74.8	93.5	112.2	130.9	149.6	168.3
186	18.6	37.2	55.8	74.4	93.0	111.6	130.2	148.8	167.4
185	18.5	37.0	55.5	74.0	92.5	111.0	129.5	148.0	166.5
184	18.4	36.8	55.2	73.6	92.0	110.4	128.8	147.2	165.6
183	18.3	36.6	54.9	73.2	91.5	109.8	128.1	146.4	164.7
182	18.2	36.4	54.6	72.8	91.0	109.2	127.4	145.6	163.8
181	18.1	36.2	54.3	72.4	90.5	108.6	126.7	144.8	162.9
180	18.0	36.0	54.0	72.0	90.0	108.0	126.0	144.0	162.0
179	17.9	35.8	53.7	71.6	89.5	107.4	125.3	143.2	161.1

No. 240
Log. 380

No. 269
Log. 431

N.	0	1	2	3	4	5	6	7	8	9	Diff.
240	38 0211	0392	0573	0754	0934	1115	1296	1476	1656	1837	181
1	2017	2197	2377	2557	2737	2917	3097	3277	3456	3636	180
2	3815	3995	4174	4353	4533	4712	4891	5070	5249	5428	179
3	5606	5785	5964	6142	6321	6499	6677	6856	7034	7212	178
4	7390	7568	7746	7924	8101	8279	8456	8634	8811	8989	178
245	9166	9343	9520	9698	9875	0051	0228	0405	0582	0759	177
6	39 0935	1112	1288	1464	1641	1817	1993	2169	2345	2521	176
7	2697	2873	3048	3224	3400	3575	3751	3926	4101	4277	176
8	4452	4627	4802	4977	5152	5326	5501	5676	5850	6025	175
9	6199	6374	6548	6722	6896	7071	7245	7419	7592	7766	174
250	7940	8114	8287	8461	8634	8808	8981	9154	9328	9501	173
1	9674	9847	0020	0192	0365	0538	0711	0883	1056	1228	173
2	40 1401	1573	1745	1917	2089	2261	2433	2605	2777	2949	172
3	3121	3292	3464	3635	3807	3978	4149	4320	4492	4663	171
4	4834	5005	5176	5346	5517	5688	5858	6029	6199	6370	171
255	6540	6710	6881	7051	7221	7391	7561	7731	7901	8070	170
6	8240	8410	8579	8749	8918	9087	9257	9426	9595	9764	169
7	9933	0102	0271	0440	0609	0777	0946	1114	1283	1451	169
8	41 1620	1788	1956	2124	2293	2461	2629	2796	2964	3132	168
9	3300	3467	3635	3803	3970	4137	4305	4472	4639	4806	167
260	4973	5140	5307	5474	5641	5808	5974	6141	6308	6474	167
1	6641	6807	6973	7139	7306	7472	7638	7804	7970	8135	166
2	8301	8467	8633	8798	8964	9129	9295	9460	9625	9791	165
3	9956	0121	0286	0451	0616	0781	0945	1110	1275	1439	165
4	42 1604	1768	1933	2097	2261	2426	2590	2754	2918	3082	164
265	3246	3410	3574	3737	3901	4065	4228	4392	4555	4718	164
6	4882	5045	5208	5371	5534	5697	5860	6023	6186	6349	163
7	6511	6674	6836	6999	7161	7324	7486	7648	7811	7973	162
8	8135	8297	8459	8621	8783	8944	9106	9268	9429	9591	162
9	9752	9914	0075	0236	0398	0559	0720	0881	1042	1203	161
	43										

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
178	17.8	35.6	53.4	71.2	89.0	106.8	124.6	142.4	160.2
177	17.7	35.4	53.1	70.8	88.5	106.2	123.9	141.6	159.3
176	17.6	35.2	52.8	70.4	88.0	105.6	123.2	140.8	158.4
175	17.5	35.0	52.5	70.0	87.5	105.0	122.5	140.0	157.5
174	17.4	34.8	52.2	69.6	87.0	104.4	121.8	139.2	156.6
173	17.3	34.6	51.9	69.2	86.5	103.8	121.1	138.4	155.7
172	17.2	34.4	51.6	68.8	86.0	103.2	120.4	137.6	154.8
171	17.1	34.2	51.3	68.4	85.5	102.6	119.7	136.8	153.9
170	17.0	34.0	51.0	68.0	85.0	102.0	119.0	136.0	153.0
169	16.9	33.8	50.7	67.6	84.5	101.4	118.3	135.2	152.1
168	16.8	33.6	50.4	67.2	84.0	100.8	117.6	134.4	151.2
167	16.7	33.4	50.1	66.8	83.5	100.2	116.9	133.6	150.3
166	16.6	33.2	49.8	66.4	83.0	99.6	116.2	132.8	149.4
165	16.5	33.0	49.5	66.0	82.5	99.0	115.5	132.0	148.5
164	16.4	32.8	49.2	65.6	82.0	98.4	114.8	131.2	147.6
163	16.3	32.6	48.9	65.2	81.5	97.8	114.1	130.4	146.7
162	16.2	32.4	48.5	64.8	81.0	97.2	113.4	129.6	145.8
161	16.1	32.2	48.3	64.4	80.5	96.6	112.7	128.8	144.9

No. 270
Log. 431

No. 299
Log. 476

N.	0	1	2	3	4	5	6	7	8	9	Diff.
270	43 1364	1525	1685	1846	2007	2167	2328	2488	2649	2809	161
1	2969	3130	3290	3450	3610	3770	3930	4090	4249	4409	160
2	4569	4729	4888	5048	5207	5367	5526	5685	5844	6004	159
3	6163	6322	6481	6640	6799	6957	7116	7275	7433	7592	159
4	7751	7909	8067	8226	8384	8542	8701	8859	9017	9175	158
275	9333	9491	9648	9806	9964	0122	0279	0437	0594	0752	158
6	44 0909	1066	1224	1381	1538	1695	1852	2009	2166	2323	157
7	2480	2637	2793	2950	3106	3263	3419	3576	3732	3889	157
8	4045	4201	4357	4513	4669	4825	4981	5137	5293	5449	156
9	5604	5760	5915	6071	6226	6382	6537	6692	6848	7003	155
280	7158	7313	7468	7623	7778	7933	8088	8242	8397	8552	155
1	8706	8861	9015	9170	9324	9478	9633	9787	9941	0095	154
2	45 0249	0403	0557	0711	0865	1018	1172	1326	1479	1633	154
3	1786	1940	2093	2247	2400	2553	2706	2859	3012	3165	153
4	3318	3471	3624	3777	3930	4082	4235	4387	4540	4692	153
285	4845	4997	5150	5302	5454	5606	5758	5910	6062	6214	152
6	6366	6518	6670	6821	6973	7125	7276	7428	7579	7731	152
7	7882	8033	8184	8336	8487	8638	8789	8940	9091	9242	151
8	9392	9543	9694	9845	9995	0146	0296	0447	0597	0748	151
9	46 0898	1048	1198	1348	1499	1649	1799	1948	2098	2248	150
290	2398	2548	2697	2847	2997	3146	3296	3445	3594	3744	150
1	3893	4042	4191	4340	4490	4639	4788	4936	5085	5234	149
2	5383	5532	5680	5829	5977	6126	6274	6423	6571	6719	149
3	6868	7016	7164	7312	7460	7608	7756	7904	8052	8200	148
4	8347	8495	8643	8790	8938	9085	9233	9380	9527	9675	148
295	9822	9969	0116	0263	0410	0557	0704	0851	0998	1145	147
6	47 1292	1438	1585	1732	1878	2025	2171	2318	2464	2610	146
7	2756	2903	3049	3195	3341	3487	3633	3779	3925	4071	146
8	4216	4362	4508	4653	4799	4944	5090	5235	5381	5526	146
9	5671	5816	5962	6107	6252	6397	6542	6687	6832	6976	145

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
161	16.1	32.2	48.3	64.4	80.5	96.6	112.7	128.8	144.9
160	16.0	32.0	48.0	64.0	80.0	96.0	112.0	128.0	144.0
159	15.9	31.8	47.7	63.6	79.5	95.4	111.3	127.2	143.1
158	15.8	31.6	47.4	63.2	79.0	94.8	110.6	126.4	142.2
157	15.7	31.4	47.1	62.8	78.5	94.2	109.9	125.6	141.3
156	15.6	31.2	46.8	62.4	78.0	93.6	109.2	124.8	140.4
155	15.5	31.0	46.5	62.0	77.5	93.0	108.5	124.0	139.5
154	15.4	30.8	46.2	61.6	77.0	92.4	107.8	123.2	138.6
153	15.3	30.6	45.9	61.2	76.5	91.8	107.1	122.4	137.7
152	15.2	30.4	45.6	60.8	76.0	91.2	106.4	121.6	136.8
151	15.1	30.2	45.3	60.4	75.5	90.6	105.7	120.8	135.9
150	15.0	30.0	45.0	60.0	75.0	90.0	105.0	120.0	135.0
149	14.9	29.8	44.7	59.6	74.5	89.4	104.3	119.2	134.1
148	14.8	29.6	44.4	59.2	74.0	88.8	103.6	118.4	133.2
147	14.7	29.4	44.1	58.8	73.5	88.2	102.9	117.6	132.3
146	14.6	29.2	43.8	58.4	73.0	87.6	102.2	116.8	131.4
145	14.5	29.0	43.5	58.0	72.5	87.0	101.5	116.0	130.5
144	14.4	28.8	43.2	57.6	72.0	86.4	100.8	115.2	129.6
143	14.3	28.6	42.9	57.2	71.5	85.8	100.1	114.4	128.7
142	14.2	28.4	42.6	56.8	71.0	85.2	99.4	113.6	127.8
141	14.1	28.2	42.3	56.4	70.5	84.6	98.7	112.8	126.9
140	14.0	28.0	42.0	56.0	70.0	84.0	98.0	112.0	126.0

No. 300
Log. 477

No. 339
Log. 531

N.	0	1	2	3	4	5	6	7	8	9	Diff.
300	47 7121	7266	7411	7555	7700	7844	7989	8133	8278	8422	145
1	8566	8711	8855	8999	9143	9287	9431	9575	9719	9863	144
2	48 0007	0151	0294	0438	0582	0725	0869	1012	1156	1299	144
3	1443	1586	1729	1872	2016	2159	2302	2445	2588	2731	143
4	2874	3016	3159	3302	3445	3587	3730	3872	4015	4157	143
305	4300	4442	4585	4727	4869	5011	5153	5295	5437	5579	142
6	5721	5863	6005	6147	6289	6430	6572	6714	6855	6997	142
7	7138	7280	7421	7563	7704	7845	7986	8127	8269	8410	141
8	8551	8692	8833	8974	9114	9255	9396	9537	9677	9818	141
9	9958	0099	0239	0380	0520	0661	0801	0941	1081	1222	140
310	49 1362	1502	1642	1782	1922	2062	2201	2341	2481	2621	140
1	2760	2900	3040	3179	3319	3458	3597	3737	3876	4015	139
2	4155	4294	4433	4572	4711	4850	4989	5128	5267	5406	139
3	5544	5683	5822	5960	6099	6238	6376	6515	6653	6791	139
4	6930	7068	7206	7344	7483	7621	7759	7897	8035	8173	138
315	8311	8448	8586	8724	8862	8999	9137	9275	9412	9550	138
6	9687	9824	9962	0099	0236	0374	0511	0648	0785	0922	137
7	50 1059	1196	1333	1470	1607	1744	1880	2017	2154	2291	137
8	2427	2564	2700	2837	2973	3109	3246	3382	3518	3655	136
9	3791	3927	4063	4199	4335	4471	4607	4743	4878	5014	136
320	5150	5286	5421	5557	5693	5828	5964	6099	6234	6370	136
1	6505	6640	6776	6911	7046	7181	7316	7451	7586	7721	135
2	7856	7991	8126	8260	8395	8530	8664	8799	8934	9068	135
3	9203	9337	9471	9606	9740	9874	0009	0143	0277	0411	134
4	51 0545	0679	0813	0947	1081	1215	1349	1482	1616	1750	134
325	1883	2017	2151	2284	2418	2551	2684	2818	2951	3084	133
6	3218	3351	3484	3617	3750	3883	4016	4149	4282	4415	133
7	4548	4681	4813	4946	5079	5211	5344	5476	5609	5741	133
8	5874	6006	6139	6271	6403	6535	6668	6800	6932	7064	132
9	7196	7328	7460	7592	7724	7855	7987	8119	8251	8382	132
330	8514	8646	8777	8909	9040	9171	9303	9434	9566	9697	131
1	9828	9959	0090	0221	0353	0484	0615	0745	0876	1007	131
2	52 1138	1269	1400	1530	1661	1792	1922	2053	2183	2314	131
3	2444	2575	2705	2835	2966	3096	3226	3356	3486	3616	130
4	3746	3876	4006	4136	4266	4396	4526	4656	4785	4915	130
335	5045	5174	5304	5434	5563	5693	5822	5951	6081	6210	129
6	6339	6469	6598	6727	6856	6985	7114	7243	7372	7501	129
7	7630	7759	7888	8016	8145	8274	8402	8531	8660	8788	129
8	8917	9045	9174	9302	9430	9559	9687	9815	9943	0072	128
9	53 0200	0328	0456	0584	0712	0840	0968	1096	1223	1351	128

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
139	13.9	27.8	41.7	55.6	69.5	83.4	97.3	111.2	125.1
138	13.8	27.6	41.4	55.2	69.0	82.8	96.6	110.4	124.2
137	13.7	27.4	41.1	54.8	68.5	82.2	95.9	109.6	123.3
136	13.6	27.2	40.8	54.4	68.0	81.6	95.2	108.8	122.4
135	13.5	27.0	40.5	54.0	67.5	81.0	94.5	108.0	121.5
134	13.4	26.8	40.2	53.6	67.0	80.4	93.8	107.2	120.6
133	13.3	26.6	39.9	53.2	66.5	79.8	93.1	106.4	119.7
132	13.2	26.4	39.6	52.8	66.0	79.2	92.4	105.6	118.8
131	13.1	26.2	39.3	52.4	65.5	78.6	91.7	104.8	117.9
130	13.0	26.0	39.0	52.0	65.0	78.0	91.0	104.0	117.0
129	12.9	25.8	38.7	51.6	64.5	77.4	90.3	103.2	116.1
128	12.8	25.6	38.4	51.2	64.0	76.8	89.6	102.4	115.2
127	12.7	25.4	38.1	50.8	63.5	76.2	88.9	101.6	114.3

No. 340
Log. 531

No. 379
Log. 579

N.	0	1	2	3	4	5	6	7	8	9	Diff.
340	53 1479	1607	1734	1862	1990	2117	2245	2372	2500	2627	128
1	2754	2882	3009	3136	3264	3391	3518	3645	3772	3899	127
2	4026	4153	4280	4407	4534	4661	4787	4914	5041	5167	127
3	5294	5421	5547	5674	5800	5927	6053	6180	6306	6432	126
4	6558	6685	6811	6937	7063	7189	7315	7441	7567	7693	126
345	7819	7945	8071	8197	8322	8448	8574	8699	8825	8951	126
6	9076	9202	9327	9452	9578	9703	9829	9954	0079	0204	125
7	54 0329	0455	0580	0705	0830	0955	1080	1205	1330	1454	125
8	1579	1704	1829	1953	2078	2203	2327	2452	2576	2701	125
9	2825	2950	3074	3199	3323	3447	3571	3696	3820	3944	124
350	4068	4192	4316	4440	4564	4688	4812	4936	5060	5183	124
1	5307	5431	5555	5678	5802	5925	6049	6172	6296	6419	124
2	6543	6666	6789	6913	7036	7159	7282	7405	7529	7652	123
3	7775	7898	8021	8144	8267	8389	8512	8635	8758	8881	123
4	9003	9126	9249	9371	9494	9616	9739	9861	9984	0106	123
355	55 0228	0351	0473	0595	0717	0840	0962	1084	1206	1328	122
6	1450	1572	1694	1816	1938	2060	2181	2303	2425	2547	122
7	2668	2790	2911	3033	3155	3276	3398	3519	3640	3762	121
8	3883	4004	4126	4247	4368	4489	4610	4731	4852	4973	121
9	5094	5215	5336	5457	5578	5699	5820	5940	6061	6182	121
360	6303	6423	6544	6664	6785	6905	7026	7146	7267	7387	120
1	7507	7627	7748	7868	7988	8108	8228	8349	8469	8589	120
2	8709	8829	8948	9068	9188	9308	9428	9548	9667	9787	120
3	9907	0026	0146	0265	0385	0504	0624	0743	0863	0982	119
4	56 1101	1221	1340	1459	1578	1698	1817	1936	2055	2174	119
365	2293	2412	2531	2650	2769	2887	3006	3125	3244	3362	119
6	3481	3600	3718	3837	3955	4074	4192	4311	4429	4548	119
7	4666	4784	4903	5021	5139	5257	5376	5494	5612	5730	118
8	5848	5966	6084	6202	6320	6437	6555	6673	6791	6909	118
9	7026	7144	7262	7379	7497	7614	7732	7849	7967	8084	118
370	8202	8319	8436	8554	8671	8788	8905	9023	9140	9257	117
1	9374	9491	9608	9725	9842	9959	0076	0193	0309	0426	117
2	57 0543	0660	0776	0893	1010	1126	1243	1359	1476	1592	117
3	1709	1825	1942	2058	2174	2291	2407	2523	2639	2755	116
4	2872	2988	3104	3220	3336	3452	3568	3684	3800	3915	116
375	4031	4147	4263	4379	4494	4610	4726	4841	4957	5072	116
6	5188	5303	5419	5534	5650	5765	5880	5996	6111	6226	115
7	6341	6457	6572	6687	6802	6917	7032	7147	7262	7377	115
8	7492	7607	7722	7836	7951	8066	8181	8295	8410	8525	115
9	8639	8754	8868	8983	9097	9212	9326	9441	9555	9669	114

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
128	12.8	25.6	38.4	51.2	64.0	76.8	89.6	102.4	115.2
127	12.7	25.4	38.1	50.8	63.5	76.2	88.9	101.6	114.3
126	12.6	25.2	37.8	50.4	63.0	75.6	88.2	100.8	113.4
125	12.5	25.0	37.5	50.0	62.5	75.0	87.5	100.0	112.5
124	12.4	24.8	37.2	49.6	62.0	74.4	86.8	99.2	111.6
123	12.3	24.6	36.9	49.2	61.5	73.8	86.1	98.4	110.7
122	12.2	24.4	36.6	48.8	61.0	73.2	85.4	97.6	109.8
121	12.1	24.2	36.3	48.4	60.5	72.6	84.7	96.8	108.9
120	12.0	24.0	36.0	48.0	60.0	72.0	84.0	96.0	108.0
119	11.9	23.8	35.7	47.6	59.5	71.4	83.3	95.2	107.1

No. 380
Log. 579

No. 414
Log. 617

N.	0	1	2	3	4	5	6	7	8	9	Diff.
380	57 9784	9898	0012	0126	0241	0355	0469	0583	0697	0811	114
1	58 0925	1039	1153	1267	1381	1495	1608	1722	1836	1950	
2	2063	2177	2291	2404	2518	2631	2745	2858	2972	3085	
3	3199	3312	3426	3539	3652	3765	3879	3992	4105	4218	
4	4331	4444	4557	4670	4783	4896	5009	5122	5235	5348	113
385	5461	5574	5686	5799	5912	6024	6137	6250	6362	6475	
6	6587	6700	6812	6925	7037	7149	7262	7374	7486	7599	
7	7711	7823	7935	8047	8160	8272	8384	8496	8608	8720	112
8	8832	8944	9056	9167	9279	9391	9503	9615	9726	9838	
9	9950	0061	0173	0284	0396	0507	0619	0730	0842	0953	
390	59 1065	1176	1287	1399	1510	1621	1732	1843	1955	2066	
1	2177	2288	2399	2510	2621	2732	2843	2954	3064	3175	111
2	3286	3397	3508	3618	3729	3840	3950	4061	4171	4282	
3	4393	4503	4614	4724	4834	4945	5055	5165	5276	5386	
4	5496	5606	5717	5827	5937	6047	6157	6267	6377	6487	
395	6597	6707	6817	6927	7037	7146	7256	7366	7476	7586	110
6	7695	7805	7914	8024	8134	8243	8353	8462	8572	8681	
7	8791	8900	9009	9119	9228	9337	9446	9556	9665	9774	
8	9883	9992	0101	0210	0319	0428	0537	0646	0755	0864	109
9	60 0973	1082	1191	1299	1408	1517	1625	1734	1843	1951	
400	2060	2169	2277	2386	2494	2603	2711	2819	2928	3036	
1	3144	3253	3361	3469	3577	3686	3794	3902	4010	4118	108
2	4226	4334	4442	4550	4658	4766	4874	4982	5089	5197	
3	5305	5413	5521	5628	5736	5844	5951	6059	6166	6274	
4	6381	6489	6596	6704	6811	6919	7026	7133	7241	7348	
405	7455	7562	7669	7777	7884	7991	8098	8205	8312	8419	107
6	8526	8633	8740	8847	8954	9061	9167	9274	9381	9488	
7	9594	9701	9808	9914	0021	0128	0234	0341	0447	0554	
8	61 0660	0767	0873	0979	1086	1192	1298	1405	1511	1617	
9	1723	1829	1936	2042	2148	2254	2360	2466	2572	2678	106
410	2784	2890	2996	3102	3207	3313	3419	3525	3630	3736	
1	3842	3947	4053	4159	4264	4370	4475	4581	4686	4792	
2	4897	5003	5108	5213	5319	5424	5529	5634	5740	5845	
3	5950	6055	6160	6265	6370	6476	6581	6686	6790	6895	105
4	7000	7105	7210	7315	7420	7525	7629	7734	7839	7943	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
118	11.8	23.6	35.4	47.2	59.0	70.8	82.6	94.4	106.2
117	11.7	23.4	35.1	46.8	58.5	70.2	81.9	93.6	105.3
116	11.6	23.2	34.8	46.4	58.0	69.6	81.2	92.8	104.4
115	11.5	23.0	34.5	46.0	57.5	69.0	80.5	92.0	103.5
114	11.4	22.8	34.2	45.6	57.0	68.4	79.8	91.2	102.6
113	11.3	22.6	33.9	45.2	56.5	67.8	79.1	90.4	101.7
112	11.2	22.4	33.6	44.8	56.0	67.2	78.4	89.6	100.8
111	11.1	22.2	33.3	44.4	55.5	66.6	77.7	88.8	99.9
110	11.0	22.0	33.0	44.0	55.0	66.0	77.0	88.0	99.0
109	10.9	21.8	32.7	43.6	54.5	65.4	76.3	87.2	98.1
108	10.8	21.6	32.4	43.2	54.0	64.8	75.6	86.4	97.2
107	10.7	21.4	32.1	42.8	53.5	64.2	74.9	85.6	96.3
106	10.6	21.2	31.8	42.4	53.0	63.6	74.2	84.8	95.4
105	10.5	21.0	31.5	42.0	52.5	63.0	73.5	84.0	94.5
104	10.4	20.8	31.2	41.6	52.0	62.4	72.8	83.2	93.6

No. 415
Log. 618

No. 459
Log. 662

N.	0	1	2	3	4	5	6	7	8	9	Diff.
415	61 8048	8153	8257	8362	8466	8571	8676	8780	8884	8989	105
6	9093	9198	9302	9406	9511	9615	9719	9824	9928	0032	
7	62 0136	0240	0344	0448	0552	0656	0760	0864	0968	1072	**104**
8	1176	1280	1384	1488	1592	1695	1799	1903	2007	2110	
9	2214	2318	2421	2525	2628	2732	2835	2939	3042	3146	
420	3249	3353	3456	3559	3663	3766	3869	3973	4076	4179	
1	4282	4385	4488	4591	4695	4798	4901	5004	5107	5210	103
2	5312	5415	5518	5621	5724	5827	5929	6032	6135	6238	
3	6340	6443	6546	6648	6751	6853	6956	7058	7161	7263	
4	7366	7468	7571	7673	7775	7878	7980	8082	8185	8287	
425	8389	8491	8593	8695	8797	8900	9002	9104	9206	9308	102
6	9410	9512	9613	9715	9817	9919	0021	0123	0224	0326	
7	63 0428	0530	0631	0733	0835	0936	1038	1139	1241	1342	
8	1444	1545	1647	1748	1849	1951	2052	2153	2255	2356	
9	2457	2559	2660	2761	2862	2963	3064	3165	3266	3367	
430	3468	3569	3670	3771	3872	3973	4074	4175	4276	4376	101
1	4477	4578	4679	4779	4880	4981	5081	5182	5283	5383	
2	5484	5584	5685	5785	5886	5986	6087	6187	6287	6388	
3	6488	6588	6688	6789	6889	6989	7089	7189	7290	7390	
4	7490	7590	7690	7790	7890	7990	8090	8190	8290	8389	100
435	8489	8589	8689	8789	8888	8988	9088	9188	9287	9387	
6	9486	9586	9686	9785	9885	9984	0084	0183	0283	0382	
7	64 0481	0581	0680	0779	0879	0978	1077	1177	1276	1375	
8	1474	1573	1672	1771	1871	1970	2069	2168	2267	2366	
9	2465	2563	2662	2761	2860	2959	3058	3156	3255	3354	99
440	3453	3551	3650	3749	3847	3946	4044	4143	4242	4340	
1	4439	4537	4636	4734	4832	4931	5029	5127	5226	5324	
2	5422	5521	5619	5717	5815	5913	6011	6110	6208	6306	
3	6404	6502	6600	6698	6796	6894	6992	7089	7187	7285	98
4	7383	7481	7579	7676	7774	7872	7969	8067	8165	8262	
445	8360	8458	8555	8653	8750	8848	8945	9043	9140	9237	
6	9335	9432	9530	9627	9724	9821	9919	0016	0113	0210	
7	65 0308	0405	0502	0599	0696	0793	0890	0987	1084	1181	
8	1278	1375	1472	1569	1666	1762	1859	1956	2053	2150	97
9	2246	2343	2440	2536	2633	2730	2826	2923	3019	3116	
450	3213	3309	3405	3502	3598	3695	3791	3888	3984	4080	
1	4177	4273	4369	4465	4562	4658	4754	4850	4946	5042	
2	5138	5235	5331	5427	5523	5619	5715	5810	5906	6002	96
3	6098	6194	6290	6386	6482	6577	6673	6769	6864	6960	
4	7056	7152	7247	7343	7438	7534	7629	7725	7820	7916	
455	8011	8107	8202	8298	8393	8488	8584	8679	8774	8870	
6	8965	9060	9155	9250	9346	9441	9536	9631	9726	9821	
7	9916	0011	0106	0201	0296	0391	0486	0581	0676	0771	95
8	66 0865	0960	1055	1150	1245	1339	1434	1529	1623	1718	
9	1813	1907	2002	2096	2191	2286	2380	2475	2569	2663	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
105	10.5	21.0	31.5	42.0	52.5	63.0	73.5	84.0	94.5
104	10.4	20.8	31.2	41.6	52.0	62.4	72.8	83.2	93.6
103	10.3	20.6	30.9	41.2	51.5	61.8	72.1	82.4	92.7
102	10.2	20.4	30.6	40.8	51.0	61.2	71.4	81.6	91.8
101	10.1	20.2	30.3	40.4	50.5	60.6	70.7	80.8	90.9
100	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0
99	9.9	19.8	29.7	39.6	49.5	59.4	69.3	79.2	89.1

No. 460
Log. 662

No. 499
Log. 698

N.	0	1	2	3	4	5	6	7	8	9	Diff.
460	66 2758	2852	2947	3041	3135	3230	3324	3418	3512	3607	
1	3701	3795	3889	3983	4078	4172	4266	4360	4454	4548	
2	4642	4736	4830	4924	5018	5112	5206	5299	5393	5487	94
3	5581	5675	5769	5862	5956	6050	6143	6237	6331	6424	
4	6518	6612	6705	6799	6892	6986	7079	7173	7266	7360	
465	7453	7546	7640	7733	7826	7920	8013	8106	8199	8293	
6	8386	8479	8572	8665	8759	8852	8945	9038	9131	9224	
7	9317	9410	9503	9596	9689	9782	9875	9967	0060	0153	93
8	67 0246	0339	0431	0524	0617	0710	0802	0895	0988	1080	
9	1173	1265	1358	1451	1543	1636	1728	1821	1913	2005	
470	2098	2190	2283	2375	2467	2560	2652	2744	2836	2929	
1	3021	3113	3205	3297	3390	3482	3574	3666	3758	3850	
2	3942	4034	4126	4218	4310	4402	4494	4586	4677	4769	92
3	4861	4953	5045	5137	5228	5320	5412	5503	5595	5687	
4	5778	5870	5962	6053	6145	6236	6328	6419	6511	6602	
475	6694	6785	6876	6968	7059	7151	7242	7333	7424	7516	
6	7607	7698	7789	7881	7972	8063	8154	8245	8336	8427	
7	8518	8609	8700	8791	8882	8973	9064	9155	9246	9337	91
8	9428	9519	9610	9700	9791	9882	9973	0063	0154	0245	
9	68 0336	0426	0517	0607	0698	0789	0879	0970	1060	1151	
480	1241	1332	1422	1513	1603	1693	1784	1874	1964	2055	
1	2145	2235	2326	2416	2506	2596	2686	2777	2867	2957	
2	3047	3137	3227	3317	3407	3497	3587	3677	3767	3857	90
3	3947	4037	4127	4217	4307	4396	4486	4576	4666	4756	
4	4845	4935	5025	5114	5204	5294	5383	5473	5563	5652	
485	5742	5831	5921	6010	6100	6189	6279	6368	6458	6547	
6	6636	6726	6815	6904	6994	7083	7172	7261	7351	7440	
7	7529	7618	7707	7796	7886	7975	8064	8153	8242	8331	89
8	8420	8509	8598	8687	8776	8865	8953	9042	9131	9220	
9	9309	9398	9486	9575	9664	9753	9841	9930	0019	0107	
490	69 0196	0285	0373	0462	0550	0639	0728	0816	0905	0993	
1	1081	1170	1258	1347	1435	1524	1612	1700	1789	1877	
2	1965	2053	2142	2230	2318	2406	2494	2583	2671	2759	
3	2847	2935	3023	3111	3199	3287	3375	3463	3551	3639	88
4	3727	3815	3903	3991	4078	4166	4254	4342	4430	4517	
495	4605	4693	4781	4868	4956	5044	5131	5219	5307	5394	
6	5482	5569	5657	5744	5832	5919	6007	6094	6182	6269	
7	6356	6444	6531	6618	6706	6793	6880	6968	7055	7142	
8	7229	7317	7404	7491	7578	7665	7752	7839	7926	8014	
9	8100	8188	8275	8362	8449	8535	8622	8709	8796	8883	87

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
98	9.8	19.6	29.4	39.2	49.0	58.8	68.6	78.4	88.2
97	9.7	19.4	29.1	38.8	48.5	58.2	67.9	77.6	87.3
96	9.6	19.2	28.8	38.4	48.0	57.6	67.2	76.8	86.4
95	9.5	19.0	28.5	38.0	47.5	57.0	66.5	76.0	85.5
94	9.4	18.8	28.2	37.6	47.0	56.4	65.8	75.2	84.6
93	9.3	18.6	27.9	37.2	46.5	55.8	65.1	74.4	83.7
92	9.2	18.4	27.6	36.8	46.0	55.2	64.4	73.6	82.8
91	9.1	18.2	27.3	36.4	45.5	54.6	63.7	72.8	81.9
90	9.0	18.0	27.0	36.0	45.0	54.0	63.0	72.0	81.0
89	8.9	17.8	26.7	35.6	44.5	53.4	62.3	71.2	80.1
88	8.8	17.6	26.4	35.2	44.0	52.8	61.6	70.4	79.2
87	8.7	17.4	26.1	34.8	43.5	52.2	60.9	69.6	78.3
86	8.6	17.2	25.8	34.4	43.0	51.6	60.2	68.8	77.4

No. 500
Log. 698

No. 544
Log. 736

N.	0	1	2	3	4	5	6	7	8	9	Diff.
500	69 8970	9057	9144	9231	9317	9404	9491	9578	9664	9751	
1	9838	9924	0011	0098	0184	0271	0358	0444	0531	0617	
2	70 0704	0790	0877	0963	1050	1136	1222	1309	1395	1482	
3	1568	1654	1741	1827	1913	1999	2086	2172	2258	2344	
4	2431	2517	2603	2689	2775	2861	2947	3033	3119	3205	
505	3291	3377	3463	3549	3635	3721	3807	3893	3979	4065	86
6	4151	4236	4322	4408	4494	4579	4665	4751	4837	4922	
7	5008	5094	5179	5265	5350	5436	5522	5607	5693	5778	
8	5864	5949	6035	6120	6206	6291	6376	6462	6547	6632	
9	6718	6803	6888	6974	7059	7144	7229	7315	7400	7485	
510	7570	7655	7740	7826	7911	7996	8081	8166	8251	8336	85
1	8421	8506	8591	8676	8761	8846	8931	9015	9100	9185	
2	9270	9355	9440	9524	9609	9694	9779	9863	9948	0033	
3	71 0117	0202	0287	0371	0456	0540	0625	0710	0794	0879	
4	0963	1048	1132	1217	1301	1385	1470	1554	1639	1723	
515	1807	1892	1976	2060	2144	2229	2313	2397	2481	2566	
6	2650	2734	2818	2902	2986	3070	3154	3238	3323	3407	84
7	3491	3575	3659	3742	3826	3910	3994	4078	4162	4246	
8	4330	4414	4497	4581	4665	4749	4833	4916	5000	5084	
9	5167	5251	5335	5418	5502	5586	5669	5753	5836	5920	
520	6003	6087	6170	6254	6337	6421	6504	6588	6671	6754	
1	6838	6921	7004	7088	7171	7254	7338	7421	7504	7587	
2	7671	7754	7837	7920	8003	8086	8169	8253	8336	8419	
3	8502	8585	8668	8751	8834	8917	9000	9083	9165	9248	83
4	9331	9414	9497	9580	9663	9745	9828	9911	9994	0077	
525	72 0159	0242	0325	0407	0490	0573	0655	0738	0821	0903	
6	0986	1068	1151	1233	1316	1398	1481	1563	1646	1728	
7	1811	1893	1975	2058	2140	2222	2305	2387	2469	2552	
8	2634	2716	2798	2881	2963	3045	3127	3209	3291	3374	82
9	3456	3538	3620	3702	3784	3866	3948	4030	4112	4194	
530	4276	4358	4440	4522	4604	4685	4767	4849	4931	5013	
1	5095	5176	5258	5340	5422	5503	5585	5667	5748	5830	
2	5912	5993	6075	6156	6238	6320	6401	6483	6564	6646	
3	6727	6809	6890	6972	7053	7134	7216	7297	7379	7460	
4	7541	7623	7704	7785	7866	7948	8029	8110	8191	8273	
535	8354	8435	8516	8597	8678	8759	8841	8922	9003	9084	81
6	9165	9246	9327	9408	9489	9570	9651	9732	9813	9893	
7	9974	0055	0136	0217	0298	0378	0459	0540	0621	0702	
8	73 0782	0863	0944	1024	1105	1186	1266	1347	1428	1508	
9	1589	1669	1750	1830	1911	1991	2072	2152	2233	2313	
540	2394	2474	2555	2635	2715	2796	2876	2956	3037	3117	
1	3197	3278	3358	3438	3518	3598	3679	3759	3839	3919	
2	3999	4079	4160	4240	4320	4400	4480	4560	4640	4720	80
3	4800	4880	4960	5040	5120	5200	5279	5359	5439	5519	
4	5599	5679	5759	5838	5918	5998	6078	6157	6237	6317	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
87	8.7	17.4	26.1	34.8	43.5	52.2	60.9	69.6	78.3
86	8.6	17.2	25.8	34.4	43.0	51.6	60.2	68.8	77.4
85	8.5	17.0	25.5	34.0	42.5	**51.0**	59.5	68.0	**76.5**
84	8.4	16.8	25.2	33.6	42.0	50.4	58.8	67.2	75.6

No. 545
Log. 736

No. 584
Log. 767

N.	0	1	2	3	4	5	6	7	8	9	Diff.
545	73 6397	6476	6556	6635	6715	6795	6874	6954	7034	7113	
6	7193	7272	7352	7431	7511	7590	7670	7749	7829	7908	
7	7987	8067	8146	8225	8305	8384	8463	8543	8622	8701	
8	8781	8860	8939	9018	9097	9177	9256	9335	9414	9493	
9	9572	9651	9731	9810	9889	9968	0047	0126	0205	0284	79
550	74 0363	0442	0521	0600	0678	0757	0836	0915	0994	1073	
1	1152	1230	1309	1388	1467	1546	1624	1703	1782	1860	
2	1939	2018	2096	2175	2254	2332	2411	2489	2568	2647	
3	2725	2804	2882	2961	3039	3118	3196	3275	3353	3431	
4	3510	3588	3667	3745	3823	3902	3980	4058	4136	4215	
555	4293	4371	4449	4528	4606	4684	4762	4840	4919	4997	
6	5075	5153	5231	5309	5387	5465	5543	5621	5699	5777	78
7	5855	5933	6011	6089	6167	6245	6323	6401	6479	6556	
8	6634	6712	6790	6868	6945	7023	7101	7179	7256	7334	
9	7412	7489	7567	7645	7722	7800	7878	7955	8033	8110	
560	8188	8266	8343	8421	8498	8576	8653	8731	8808	8885	
1	8963	9040	9118	9195	9272	9350	9427	9504	9582	9659	
2	9736	9814	9891	9968	0045	0123	0200	0277	0354	0431	
3	75 0508	0586	0663	0740	0817	0894	0971	1048	1125	1202	
4	1279	1356	1433	1510	1587	1664	1741	1818	1895	1972	
565	2048	2125	2202	2279	2356	2433	2509	2586	2663	2740	77
6	2816	2893	2970	3047	3123	3200	3277	3353	3430	3506	
7	3583	3660	3736	3813	3889	3966	4042	4119	4195	4272	
8	4348	4425	4501	4578	4654	4730	4807	4883	4960	5036	
9	5112	5189	5265	5341	5417	5494	5570	5646	5722	5799	
570	5875	5951	6027	6103	6180	6256	6332	6408	6484	6560	
1	6636	6712	6788	6864	6940	7016	7092	7168	7244	7320	76
2	7396	7472	7548	7624	7700	7775	7851	7927	8003	8079	
3	8155	8230	8306	8382	8458	8533	8609	8685	8761	8836	
4	8912	8988	9063	9139	9214	9290	9366	9441	9517	9592	
575	9668	9743	9819	9894	9970	0045	0121	0196	0272	0347	
6	76 0422	0498	0573	0649	0724	0799	0875	0950	1025	1101	
7	1176	1251	1326	1402	1477	1552	1627	1702	1778	1853	
8	1928	2003	2078	2153	2228	2303	2378	2453	2529	2604	
9	2679	2754	2829	2904	2978	3053	3128	3203	3278	3353	75
580	3428	3503	3578	3653	3727	3802	3877	3952	4027	4101	
1	4176	4251	4326	4400	4475	4550	4624	4699	4774	4848	
2	4923	4998	5072	5147	5221	5296	5370	5445	5520	5594	
3	5669	5743	5818	5892	5966	6041	6115	6190	6264	6338	
4	6413	6487	6562	6636	6710	6785	6859	6933	7007	7082	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
83	8.3	16.6	24.9	33.2	41.5	49.8	58.1	66.4	74.7
82	8.2	16.4	24.6	32.8	41.0	49.2	57.4	65.6	73 8
81	8.1	16.2	24.3	32.4	40.5	48.6	56.7	64.8	72.3
80	8.0	16.0	24.0	32.0	40.0	48.0	56.0	64.0	72.0
79	7.9	15.8	23.7	31.6	39.5	47.4	55.3	63.2	71.1
78	7.8	15.6	23.4	31.2	39.0	46.8	54.6	62.4	70.2
77	7.7	15.4	23.1	30.8	38.5	46.2	53.9	61.6	69.3
76	7.6	15.2	22.8	30.4	38.0	45.6	53.2	60.8	68.4
75	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0	67.5
74	7.4	14.8	22.2	29.6	37.0	44.4	51.8	59.2	66.6

No. 585
Log. 767

No. 629
Log. 799

N.	0	1	2	3	4	5	6	7	8	9	Diff.
585	76 7156	7230	7304	7379	7453	7527	7601	7675	7749	7823	
6	7898	7972	8046	8120	8194	8268	8342	8416	8490	8564	74
7	8638	8712	8786	8860	8934	9008	9082	9156	9230	9303	
8	9377	9451	9525	9599	9673	9746	9820	9894	9968	0042	
9	77 0115	0189	0263	0336	0410	0484	0557	0631	0705	0778	
590	0852	0926	0999	1073	1146	1220	1293	1367	1440	1514	
1	1587	1661	1734	1808	1881	1955	2028	2102	2175	2248	
2	2322	2395	2468	2542	2615	2688	2762	2835	2908	2981	
3	3055	3128	3201	3274	3348	3421	3494	3567	3640	3713	
4	3786	3860	3933	4006	4079	4152	4225	4298	4371	4444	73
595	4517	4590	4663	4736	4809	4882	4955	5028	5100	5173	
6	5246	5319	5392	5465	5538	5610	5683	5756	5829	5902	
7	5974	6047	6120	6193	6265	6338	6411	6483	6556	6629	
8	6701	6774	6846	6919	6992	7064	7137	7209	7282	7354	
9	7427	7499	7572	7644	7717	7789	7862	7934	8006	8079	
600	8151	8224	8296	8368	8441	8513	8585	8658	8730	8802	
1	8874	8947	9019	9091	9163	9236	9308	9380	9452	9524	
2	9596	9669	9741	9813	9885	9957	0029	0101	0173	0245	72
3	78 0317	0389	0461	0533	0605	0677	0749	0821	0893	0965	
4	1037	1109	1181	1253	1324	1396	1468	1540	1612	1684	
605	1755	1827	1899	1971	2042	2114	2186	2258	2329	2401	
6	2473	2544	2616	2688	2759	2831	2902	2974	3046	3117	
7	3189	3260	3332	3403	3475	3546	3618	3689	3761	3832	
8	3904	3975	4046	4118	4189	4261	4332	4403	4475	4546	
9	4617	4689	4760	4831	4902	4974	5045	5116	5187	5259	
610	5330	5401	5472	5543	5615	5686	5757	5828	5899	5970	
1	6041	6112	6183	6254	6325	6396	6467	6538	6609	6680	71
2	6751	6822	6893	6964	7035	7106	7177	7248	7319	7390	
3	7460	7531	7602	7673	7744	7815	7885	7956	8027	8098	
4	8168	8239	8310	8381	8451	8522	8593	8663	8734	8804	
615	8875	8946	9016	9087	9157	9228	9299	9369	9440	9510	
6	9581	9651	9722	9792	9863	9933	0004	0074	0144	0215	
7	79 0285	0356	0426	0496	0567	0637	0707	0778	0848	0918	
8	0988	1059	1129	1199	1269	1340	1410	1480	1550	1620	
9	1691	1761	1831	1901	1971	2041	2111	2181	2252	2322	
620	2392	2462	2532	2602	2672	2742	2812	2882	2952	3022	70
1	3092	3162	3231	3301	3371	3441	3511	3581	3651	3721	
2	3790	3860	3930	4000	4070	4139	4209	4279	4349	4418	
3	4488	4558	4627	4697	4767	4836	4906	4976	5045	5115	
4	5185	5254	5324	5393	5463	5532	5602	5672	5741	5811	
625	5880	5949	6019	6088	6158	6227	6297	6366	6436	6505	
6	6574	6644	6713	6782	6852	6921	6990	7060	7129	7198	
7	7268	7337	7406	7475	7545	7614	7683	7752	7821	7890	
8	7960	8029	8098	8167	8236	8305	8374	8443	8513	8582	
9	8651	8720	8789	8858	8927	8996	9065	9134	9203	9272	69

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
75	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0	67.5
74	7.4	14.8	22.2	29.6	37.0	44.4	51.8	59.2	66.6
73	7.3	14.6	21.9	29.2	36.5	43.8	51.1	58.4	65.7
72	7.2	14.4	21.6	28.8	36.0	43.2	50.4	57.6	64.8
71	7.1	14.2	21.3	28.4	35.5	42.6	49.7	56.8	63.9
70	7.0	14.0	21.0	28.0	35.0	42.0	49.0	56.0	63.0
69	6.9	13.8	20.7	27.6	34.5	41.4	48.3	55.2	62.1

No. 630
Log. 799

No. 674
Log. 829

N.	0	1	2	3	4	5	6	7	8	9	Diff.
630	79 9341	9409	9478	9547	9616	9685	9754	9823	9892	9961	
1	80 0029	0098	0167	0236	0305	0373	0442	0511	0580	0648	
2	0717	0786	0854	0923	0992	1061	1129	1198	1266	1335	
3	1404	1472	1541	1609	1678	1747	1815	1884	1952	2021	
4	2089	2158	2226	2295	2363	2432	2500	2568	2637	2705	
635	2774	2842	2910	2979	3047	3116	3184	3252	3321	3389	
6	3457	3525	3594	3662	3730	3798	3867	3935	4003	4071	
7	4139	4208	4276	4344	4412	4480	4548	4616	4685	4753	
8	4821	4889	4957	5025	5093	5161	5229	5297	5365	5433	68
9	5501	5569	5637	5705	5773	5841	5908	5976	6044	6112	
640	6180	6248	6316	6384	6451	6519	6587	6655	6723	6790	
1	6858	6926	6994	7061	7129	7197	7264	7332	7400	7467	
2	7535	7603	7670	7738	7806	7873	7941	8008	8076	8143	
3	8211	8279	8346	8414	8481	8549	8616	8684	8751	8818	
4	8886	8953	9021	9088	9156	9223	9290	9358	9425	9492	
645	9560	9627	9694	9762	9829	9896	9964	0031	0098	0165	
6	81 0233	0300	0367	0434	0501	0569	0636	0703	0770	0837	
7	0904	0971	1039	1106	1173	1240	1307	1374	1441	1508	67
8	1575	1642	1709	1776	1843	1910	1977	2044	2111	2178	
9	2245	2312	2379	2445	2512	2579	2646	2713	2780	2847	
650	2913	2980	3047	3114	3181	3247	3314	3381	3448	3514	
1	3581	3648	3714	3781	3848	3914	3981	4048	4114	4181	
2	4248	4314	4381	4447	4514	4581	4647	4714	4780	4847	
3	4913	4980	5046	5113	5179	5246	5312	5378	5445	5511	
4	5578	5644	5711	5777	5843	5910	5976	6042	6109	6175	
655	6241	6308	6374	6440	6506	6573	6639	6705	6771	6838	
6	6904	6970	7036	7102	7169	7235	7301	7367	7433	7499	
7	7565	7631	7698	7764	7830	7896	7962	8028	8094	8160	
8	8226	8292	8358	8424	8490	8556	8622	8688	8754	8820	
9	8885	8951	9017	9083	9149	9215	9281	9346	9412	9478	66
660	9544	9610	9676	9741	9807	9873	9939	0004	0070	0136	
1	82 0201	0267	0333	0399	0464	0530	0595	0661	0727	0792	
2	0858	0924	0989	1055	1120	1186	1251	1317	1382	1448	
3	1514	1579	1645	1710	1775	1841	1906	1972	2037	2103	
4	2168	2233	2299	2364	2430	2495	2560	2626	2691	2756	
665	2822	2887	2952	3018	3083	3148	3213	3279	3344	3409	
6	3474	3539	3605	3670	3735	3800	3865	3930	3996	4061	
7	4126	4191	4256	4321	4386	4451	4516	4581	4646	4711	
8	4776	4841	4906	4971	5036	5101	5166	5231	5296	5361	65
9	5426	5491	5556	5621	5686	5751	5815	5880	5945	6010	
670	6075	6140	6204	6269	6334	6399	6464	6528	6593	6658	
1	6723	6787	6852	6917	6981	7046	7111	7175	7240	7305	
2	7369	7434	7499	7563	7628	7692	7757	7821	7886	7951	
3	8015	8080	8144	8209	8273	8338	8402	8467	8531	8595	
4	8660	8724	8789	8853	8918	8982	9046	9111	9175	9239	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
68	6.8	13.6	20.4	27.2	34.0	40.8	47.6	54.4	61.2
67	6.7	13.4	20.1	26.8	33.5	40.2	46.9	53.6	60.3
66	6.6	13.2	19.8	26.4	33.0	39.6	46.2	52.8	59.4
65	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0	58.5
64	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6

No. 675
Log. 829

No. 719
Log. 857

N.	0	1	2	3	4	5	6	7	8	9	Diff.
675	82 9304	9368	9432	9497	9561	9625	9690	9754	9818	9882	
6	9947	0011	0075	0139	0204	0268	0332	0396	0460	0525	
7	83 0589	0653	0717	0781	0845	0909	0973	1037	1102	1166	
8	1230	1294	1358	1422	1486	1550	1614	1678	1742	1806	64
9	1870	1934	1998	2062	2126	2189	2253	2317	2381	2445	
680	2509	2573	2637	2700	2764	2828	2892	2956	3020	3083	
1	3147	3211	3275	3338	3402	3466	3530	3593	3657	3721	
2	3784	3848	3912	3975	4039	4103	4166	4230	4294	4357	
3	4421	4484	4548	4611	4675	4739	4802	4866	4929	4993	
4	5056	5120	5183	5247	5310	5373	5437	5500	5564	5627	
685	5691	5754	5817	5881	5944	6007	6071	6134	6197	6261	
6	6324	6387	6451	6514	6577	6641	6704	6767	6830	6894	
7	6957	7020	7083	7146	7210	7273	7336	7399	7462	7525	
8	7588	7652	7715	7778	7841	7904	7967	8030	8093	8156	
9	8219	8282	8345	8408	8471	8534	8597	8660	8723	8786	63
690	8849	8912	8975	9038	9101	9164	9227	9289	9352	9415	
1	9478	9541	9604	9667	9729	9792	9855	9918	9981	0043	
2	84 0106	0169	0232	0294	0357	0420	0482	0545	0608	0671	
3	0733	0796	0859	0921	0984	1046	1109	1172	1234	1297	
4	1359	1422	1485	1547	1610	1672	1735	1797	1860	1922	
695	1985	2047	2110	2172	2235	2297	2360	2422	2484	2547	
6	2609	2672	2734	2796	2859	2921	2983	3046	3108	3170	
7	3233	3295	3357	3420	3482	3544	3606	3669	3731	3793	
8	3855	3918	3980	4042	4104	4166	4229	4291	4353	4415	
9	4477	4539	4601	4664	4726	4788	4850	4912	4974	5036	
700	5098	5160	5222	5284	5346	5408	5470	5532	5594	5656	62
1	5718	5780	5842	5904	5966	6028	6090	6151	6213	6275	
2	6337	6399	6461	6523	6585	6646	6708	6770	6832	6894	
3	6955	7017	7079	7141	7202	7264	7326	7388	7449	7511	
4	7573	7634	7696	7758	7819	7881	7943	8004	8066	8128	
705	8189	8251	8312	8374	8435	8497	8559	8620	8682	8743	
6	8805	8866	8928	8989	9051	9112	9174	9235	9297	9358	
7	9419	9481	9542	9604	9665	9726	9788	9849	9911	9972	
8	85 0033	0095	0156	0217	0279	0340	0401	0462	0524	0585	
9	0646	0707	0769	0830	0891	0952	1014	1075	1136	1197	
710	1258	1320	1381	1442	1503	1564	1625	1686	1747	1809	
1	1870	1931	1992	2053	2114	2175	2236	2297	2358	2419	
2	2480	2541	2602	2663	2724	2785	2846	2907	2968	3029	61
3	3090	3150	3211	3272	3333	3394	3455	3516	3577	3637	
4	3698	3759	3820	3881	3941	4002	4063	4124	4185	4245	
715	4306	4367	4428	4488	4549	4610	4670	4731	4792	4852	
6	4913	4974	5034	5095	5156	5216	5277	5337	5398	5459	
7	5519	5580	5640	5701	5761	5822	5882	5943	6003	6064	
8	6124	6185	6245	6306	6366	6427	6487	6548	6608	6668	
9	6729	6789	6850	6910	6970	7031	7091	7152	7212	7272	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
65	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0	58.5
64	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6
63	6.3	12.6	18.9	25.2	31.5	37.8	44.1	50.4	56.7
62	6.2	12.4	18.6	24.8	31.0	37.2	43.4	49.6	55.8
61	6.1	12.2	18.3	24.4	30.5	36.6	42.7	48.8	54.9
60	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0

No. 720
Log. 857

No. 764
Log. 883

N.	0	1	2	3	4	5	6	7	8	9	Diff.
720	85 7332	7393	7453	7513	7574	7634	7694	7755	7815	7875	
1	7935	7995	8056	8116	8176	8236	8297	8357	8417	8477	
2	8537	8597	8657	8718	8778	8838	8898	8958	9018	9078	
3	9138	9198	9258	9318	9379	9439	9499	9559	9619	9679	60
4	9739	9799	9859	9918	9978	0038	0098	0158	0218	0278	
725	86 0338	0398	0458	0518	0578	0637	0697	0757	0817	0877	
6	0937	0996	1056	1116	1176	1236	1295	1355	1415	1475	
7	1534	1594	1654	1714	1773	1833	1893	1952	2012	2072	
8	2131	2191	2251	2310	2370	2430	2489	2549	2608	2668	
9	2728	2787	2847	2906	2966	3025	3085	3144	3204	3263	
730	3323	3382	3442	3501	3561	3620	3680	3739	3799	3858	
1	3917	3977	4036	4096	4155	4214	4274	4333	4392	4452	
2	4511	4570	4630	4689	4748	4808	4867	4926	4985	5045	
3	5104	5163	5222	5282	5341	5400	5459	5519	5578	5637	
4	5696	5755	5814	5874	5933	5992	6051	6110	6169	6228	
735	6287	6346	6405	6465	6524	6583	6642	6701	6760	6819	
6	6878	6937	6996	7055	7114	7173	7232	7291	7350	7409	59
7	7467	7526	7585	7644	7703	7762	7821	7880	7939	7998	
8	8056	8115	8174	8233	8292	8350	8409	8468	8527	8586	
9	8644	8703	8762	8821	8879	8938	8997	9056	9114	9173	
740	9232	9290	9349	9408	9466	9525	9584	9642	9701	9760	
1	9818	9877	9935	9994	0053	0111	0170	0228	0287	0345	
2	87 0404	0462	0521	0579	0638	0696	0755	0813	0872	0930	
3	0989	1047	1106	1164	1223	1281	1339	1398	1456	1515	
4	1573	1631	1690	1748	1806	1865	1923	1981	2040	2098	
745	2156	2215	2273	2331	2389	2448	2506	2564	2622	2681	
6	2739	2797	2855	2913	2972	3030	3088	3146	3204	3262	
7	3321	3379	3437	3495	3553	3611	3669	3727	3785	3844	
8	3902	3960	4018	4076	4134	4192	4250	4308	4366	4424	
9	4482	4540	4598	4656	4714	4772	4830	4888	4945	5003	58
750	5061	5119	5177	5235	5293	5351	5409	5466	5524	5582	
1	5640	5698	5756	5813	5871	5929	5987	6045	6102	6160	
2	6218	6276	6333	6391	6449	6507	6564	6622	6680	6737	
3	6795	6853	6910	6968	7026	7083	7141	7199	7256	7314	
4	7371	7429	7487	7544	7602	7659	7717	7774	7832	7889	
755	7947	8004	8062	8119	8177	8234	8292	8349	8407	8464	
6	8522	8579	8637	8694	8752	8809	8866	8924	8981	9039	
7	9096	9153	9211	9268	9325	9383	9440	9497	9555	9612	
8	9669	9726	9784	9841	9898	9956	0013	0070	0127	0185	
9	88 0242	0299	0356	0413	0471	0528	0585	0642	0699	0756	
760	0814	0871	0928	0985	1042	1099	1156	1213	1271	1328	
1	1385	1442	1499	1556	1613	1670	1727	1784	1841	1898	
2	1955	2012	2069	2126	2183	2240	2297	2354	2411	2468	
3	2525	2581	2638	2695	2752	2809	2866	2923	2980	3037	57
4	3093	3150	3207	3264	3321	3377	3434	3491	3548	3605	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
59	5.9	11.8	17.7	23.6	29.5	35.4	41.3	47.2	53.1
58	5.8	11.6	17.4	23.2	29.0	34.8	40.6	46.4	52.2
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4

No. 765
Log. 883

No. 809
Log. 908

N.	0	1	2	3	4	5	6	7	8	9	Diff.
765	88 3661	3718	3775	3832	3888	3945	4002	4059	4115	4172	
6	4229	4285	4342	4399	4455	4512	4569	4625	4682	4739	
7	4795	4852	4909	4965	5022	5078	5135	5192	5248	5305	
8	5361	5418	5474	5531	5587	5644	5700	5757	5813	5870	
9	5926	5983	6039	6096	6152	6209	6265	6321	6378	6434	
770	6491	6547	6604	6660	6716	6773	6829	6885	6942	6998	
1	7054	7111	7167	7223	7280	7336	7392	7449	7505	7561	
2	7617	7674	7730	7786	7842	7898	7955	8011	8067	8123	
3	8179	8236	8292	8348	8404	8460	8516	8573	8629	8685	
4	8741	8797	8853	8909	8965	9021	9077	9134	9190	9246	
775	9302	9358	9414	9470	9526	9582	9638	9694	9750	9806	56
6	9862	9918	9974	0030	0086	0141	0197	0253	0309	0365	
7	89 0421	0477	0533	0589	0645	0700	0756	0812	0868	0924	
8	0980	1035	1091	1147	1203	1259	1314	1370	1426	1482	
9	1537	1593	1649	1705	1760	1816	1872	1928	1983	2039	
780	2095	2150	2206	2262	2317	2373	2429	2484	2540	2595	
1	2651	2707	2762	2818	2873	2929	2985	3040	3096	3151	
2	3207	3262	3318	3373	3429	3484	3540	3595	3651	3706	
3	3762	3817	3873	3928	3984	4039	4094	4150	4205	4261	
4	4316	4371	4427	4482	4538	4593	4648	4704	4759	4814	
785	4870	4925	4980	5036	5091	5146	5201	5257	5312	5367	
6	5423	5478	5533	5588	5644	5699	5754	5809	5864	5920	
7	5975	6030	6085	6140	6195	6251	6306	6361	6416	6471	
8	6526	6581	6636	6692	6747	6802	6857	6912	6967	7022	
9	7077	7132	7187	7242	7297	7352	7407	7462	7517	7572	
790	7627	7682	7737	7792	7847	7902	7957	8012	8067	8122	55
1	8176	8231	8286	8341	8396	8451	8506	8561	8615	8670	
2	8725	8780	8835	8890	8944	8999	9054	9109	9164	9218	
3	9273	9328	9383	9437	9492	9547	9602	9656	9711	9766	
4	9821	9875	9930	9985	0039	0094	0149	0203	0258	0312	
795	90 0367	0422	0476	0531	0586	0640	0695	0749	0804	0859	
6	0913	0968	1022	1077	1131	1186	1240	1295	1349	1404	
7	1458	1513	1567	1622	1676	1731	1785	1840	1894	1948	
8	2003	2057	2112	2166	2221	2275	2329	2384	2438	2492	
9	2547	2601	2655	2710	2764	2818	2873	2927	2981	3036	
800	3090	3144	3199	3253	3307	3361	3416	3470	3524	3578	
1	3633	3687	3741	3795	3849	3904	3958	4012	4066	4120	
2	4174	4229	4283	4337	4391	4445	4499	4553	4607	4661	
3	4716	4770	4824	4878	4932	4986	5040	5094	5148	5202	
4	5256	5310	5364	5418	5472	5526	5580	5634	5688	5742	54
805	5796	5850	5904	5958	6012	6066	6119	6173	6227	6281	
6	6335	6389	6443	6497	6551	6604	6658	6712	6766	6820	
7	6874	6927	6981	7035	7089	7143	7196	7250	7304	7358	
8	7411	7465	7519	7573	7626	7680	7734	7787	7841	7895	
9	7949	8002	8056	8110	8163	8217	8270	8324	8378	8431	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4
55	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5
54	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6

No. 810
Log. 908

No. 854
Log. 931

N.	0	1	2	3	4	5	6	7	8	9	Diff.
810	90 8485	8539	8592	8646	8699	8753	8807	8860	8914	8967	
1	9021	9074	9128	9181	9235	9289	9342	9396	9449	9503	
2	9556	9610	9663	9716	9770	9823	9877	9930	9984	0037	
3	91 0091	0144	0197	0251	0304	0358	0411	0464	0518	0571	
4	0624	0678	0731	0784	0838	0891	0944	0998	1051	1104	
815	1158	1211	1264	1317	1371	1424	1477	1530	1584	1637	
6	1690	1743	1797	1850	1903	1956	2009	2063	2116	2169	
7	2222	2275	2328	2381	2435	2488	2541	2594	2647	2700	
8	2753	2806	2859	2913	2966	3019	3072	3125	3178	3231	
9	3284	3337	3390	3443	3496	3549	3602	3655	3708	3761	53
820	3814	3867	3920	3973	4026	4079	4132	4184	4237	4290	
1	4343	4396	4449	4502	4555	4608	4660	4713	4766	4819	
2	4872	4925	4977	5030	5083	5136	5189	5241	5294	5347	
3	5400	5453	5505	5558	5611	5664	5716	5769	5822	5875	
4	5927	5980	6033	6085	6138	6191	6243	6296	6349	6401	
825	6454	6507	6559	6612	6664	6717	6770	6822	6875	6927	
6	6980	7033	7085	7138	7190	7243	7295	7348	7400	7453	
7	7506	7558	7611	7663	7716	7768	7820	7873	7925	7978	
8	8030	8083	8135	8188	8240	8293	8345	8397	8450	8502	
9	8555	8607	8659	8712	8764	8816	8869	8921	8973	9026	
830	9078	9130	9183	9235	9287	9340	9392	9444	9496	9549	
1	9601	9653	9706	9758	9810	9862	9914	9967	0019	0071	
2	92 0123	0176	0228	0280	0332	0384	0436	0489	0541	0593	
3	0645	0697	0749	0801	0853	0906	0958	1010	1062	1114	
4	1166	1218	1270	1322	1374	1426	1478	1530	1582	1634	52
835	1686	1738	1790	1842	1894	1946	1998	2050	2102	2154	
6	2206	2258	2310	2362	2414	2466	2518	2570	2622	2674	
7	2725	2777	2829	2881	2933	2985	3037	3089	3140	3192	
8	3244	3296	3348	3399	3451	3503	3555	3607	3658	3710	
9	3762	3814	3865	3917	3969	4021	4072	4124	4176	4228	
840	4279	4331	4383	4434	4486	4538	4589	4641	4693	4744	
1	4796	4848	4899	4951	5003	5054	5106	5157	5209	5261	
2	5312	5364	5415	5467	5518	5570	5621	5673	5725	5776	
3	5828	5879	5931	5982	6034	6085	6137	6188	6240	6291	
4	6342	6394	6445	6497	6548	6600	6651	6702	6754	6805	
845	6857	6908	6959	7011	7062	7114	7165	7216	7268	7319	
6	7370	7422	7473	7524	7576	7627	7678	7730	7781	7832	
7	7883	7935	7986	8037	8088	8140	8191	8242	8293	8345	
8	8396	8447	8498	8549	8601	8652	8703	8754	8805	8857	
9	8908	8959	9010	9061	9112	9163	9215	9266	9317	9368	
850	9419	9470	9521	9572	9623	9674	9725	9776	9827	9879	51
1	9930	9981	0032	0083	0134	0185	0236	0287	0338	0389	
2	93 0440	0491	0542	0592	0643	0694	0745	0796	0847	0898	
3	0949	1000	1051	1102	1153	1204	1254	1305	1356	1407	
4	1458	1509	1560	1610	1661	1712	1763	1814	1865	1915	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
53	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.4	47.7
52	5.2	10.4	15.6	20.8	26.0	31.2	36.4	41.6	46.8
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0

No. 855
Log. 931

No. 899
Log. 954

N.	0	1	2	3	4	5	6	7	8	9	Diff.
855	93 1966	2017	2068	2118	2169	2220	2271	2322	2372	2423	
6	2474	2524	2575	2626	2677	2727	2778	2829	2879	2930	
7	2981	3031	3082	3133	3183	3234	3285	3335	3386	3437	
8	3487	3538	3589	3639	3690	3740	3791	3841	3892	3943	
9	3993	4044	4094	4145	4195	4246	4296	4347	4397	4448	
860	4498	4549	4599	4650	4700	4751	4801	4852	4902	4953	
1	5003	5054	5104	5154	5205	5255	5306	5356	5406	5457	
2	5507	5558	5608	5658	5709	5759	5809	5860	5910	5960	
3	6011	6061	6111	6162	6212	6262	6313	6363	6413	6463	
4	6514	6564	6614	6665	6715	6765	6815	6865	6916	6966	
865	7016	7066	7116	7167	7217	7267	7317	7367	7418	7468	
6	7518	7568	7618	7668	7718	7769	7819	7869	7919	7969	
7	8019	8069	8119	8169	8219	8269	8320	8370	8420	8470	50
8	8520	8570	8620	8670	8720	8770	8820	8870	8920	8970	
9	9020	9070	9120	9170	9220	9270	9320	9369	9419	9469	
870	9519	9569	9619	9669	9719	9769	9819	9869	9918	9968	
1	94 0018	0068	0118	0168	0218	0267	0317	0367	0417	0467	
2	0516	0566	0616	0666	0716	0765	0815	0865	0915	0964	
3	1014	1064	1114	1163	1213	1263	1313	1362	1412	1462	
4	1511	1561	1611	1660	1710	1760	1809	1859	1909	1958	
875	2008	2058	2107	2157	2207	2256	2306	2355	2405	2455	
6	2504	2554	2603	2653	2702	2752	2801	2851	2901	2950	
7	3000	3049	3099	3148	3198	3247	3297	3346	3396	3445	
8	3495	3544	3593	3643	3692	3742	3791	3841	3890	2939	
9	3989	4038	4088	4137	4186	4236	4285	4335	4384	4433	
880	4483	4532	4581	4631	4680	4729	4779	4828	4877	4927	
1	4976	5025	5074	5124	5173	5222	5272	5321	5370	5419	
2	5469	5518	5567	5616	5665	5715	5764	5813	5862	5912	
3	5961	6010	6059	6108	6157	6207	6256	6305	6354	6403	
4	6452	6501	6551	6600	6649	6698	6747	6796	6845	6894	
885	6943	6992	7041	7090	7139	7189	7238	7287	7336	7385	
6	7434	7483	7532	7581	7630	7679	7728	7777	7826	7875	49
7	7924	7973	8022	8070	8119	8168	8217	8266	8315	8364	
8	8413	8462	8511	8560	8608	8657	8706	8755	8804	8853	
9	8902	8951	8999	9048	9097	9146	9195	9244	9292	9341	
890	9390	9439	9488	9536	9585	9634	9683	9731	9780	9829	
1	9878	9926	9975	0024	0073	0121	0170	0219	0267	0316	
2	95 0365	0414	0462	0511	0560	0608	0657	0706	0754	0803	
3	0851	0900	0949	0997	1046	1095	1143	1192	1240	1289	
4	1338	1386	1435	1483	1532	1580	1629	1677	1726	1775	
895	1823	1872	1920	1969	2017	2066	2114	2163	2211	2260	
6	2308	2356	2405	2453	2502	2550	2599	2647	2696	2744	
7	2792	2841	2889	2938	2986	3034	3083	3131	3180	3228	
8	3276	3325	3373	3421	3470	3518	3566	3615	3663	3711	
9	3760	3808	3856	3905	3953	4001	4049	4098	4146	4194	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2

No. 900
Log. 954

No. 944
Log. 975

N.	0	1	2	3	4	5	6	7	8	9	Diff.
900	95 4243	4291	4339	4387	4435	4484	4532	4580	4628	4677	
1	4725	4773	4821	4869	4918	4966	5014	5062	5110	5158	
2	5207	5255	5303	5351	5399	5447	5495	5543	5592	5640	
3	5688	5736	5784	5832	5880	5928	5976	6024	6072	6120	
4	6168	6216	6265	6313	6361	6409	6457	6505	6553	6601	48
905	6649	6697	6745	6793	6840	6888	6936	6984	7032	7080	
6	7128	7176	7224	7272	7320	7368	7416	7464	7512	7559	
7	7607	7655	7703	7751	7799	7847	7894	7942	7990	8038	
8	8086	8134	8181	8229	8277	8325	8373	8421	8468	8516	
9	8564	8612	8659	8707	8755	8803	8850	8898	8946	8994	
910	9041	9089	9137	9185	9232	9280	9328	9375	9423	9471	
1	9518	9566	9614	9661	9709	9757	9804	9852	9900	9947	
2	9995	0042	0090	0138	0185	0233	0280	0328	0376	0423	
3	96 0471	0518	0566	0613	0661	0709	0756	0804	0851	0899	
4	0946	0994	1041	1089	1136	1184	1231	1279	1326	1374	
915	1421	1469	1516	1563	1611	1658	1706	1753	1801	1848	
6	1895	1943	1990	2038	2085	2132	2180	2227	2275	2322	
7	2369	2417	2464	2511	2559	2606	2653	2701	2748	2795	
8	2843	2890	2937	2985	3032	3079	3126	3174	3221	3268	
9	3316	3363	3410	3457	3504	3552	3599	3646	3693	3741	
920	3788	3835	3882	3929	3977	4024	4071	4118	4165	4212	
1	4260	4307	4354	4401	4448	4495	4542	4590	4637	4684	
2	4731	4778	4825	4872	4919	4966	5013	5061	5108	5155	
3	5202	5249	5296	5343	5390	5437	5484	5531	5578	5625	
4	5672	5719	5766	5813	5860	5907	5954	6001	6048	6095	47
925	6142	6189	6236	6283	6329	6376	6423	6470	6517	6564	
6	6611	6658	6705	6752	6799	6845	6892	6939	6986	7033	
7	7080	7127	7173	7220	7267	7314	7361	7408	7454	7501	
8	7548	7595	7642	7688	7735	7782	7829	7875	7922	7969	
9	8016	8062	8109	8156	8203	8249	8296	8343	8390	8436	
930	8483	8530	8576	8623	8670	8716	8763	8810	8856	8903	
1	8950	8996	9043	9090	9136	9183	9229	9276	9323	9369	
2	9416	9463	9509	9556	9602	9649	9695	9742	9789	9835	
3	9882	9928	9975	0021	0068	0114	0161	0207	0254	0300	
4	97 0347	0393	0440	0486	0533	0579	0626	0672	0719	0765	
935	0812	0858	0904	0951	0997	1044	1090	1137	1183	1229	
6	1276	1322	1369	1415	1461	1508	1554	1601	1647	1693	
7	1740	1786	1832	1879	1925	1971	2018	2064	2110	2157	
8	2203	2249	2295	2342	2388	2434	2481	2527	2573	2619	
9	2666	2712	2758	2804	2851	2897	2943	2989	3035	3082	
940	3128	3174	3220	3266	3313	3359	3405	3451	3497	3543	
1	3590	3636	3682	3728	3774	3820	3866	3913	3959	4005	
2	4051	4097	4143	4189	4235	4281	4327	4374	4420	4466	
3	4512	4558	4604	4650	4696	4742	4788	4834	4880	4926	
4	4972	5018	5064	5110	5156	5202	5248	5294	5340	5386	46

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4

No. 945
Log. 975

No. 989
Log. 995

N.	0	1	2	3	4	5	6	7	8	9	Diff.
945	97 5432	5478	5524	5570	5616	5662	5707	5753	5799	5845	
6	5891	5937	5983	6029	6075	6121	6167	6212	6258	6304	
7	6350	6396	6442	6488	6533	6579	6625	6671	6717	6763	
8	6808	6854	6900	6946	6992	7037	7083	7129	7175	7220	
9	7266	7312	7358	7403	7449	7495	7541	7586	7632	7678	
950	7724	7769	7815	7861	7906	7952	7998	8043	8089	8135	
1	8181	8226	8272	8317	8363	8409	8454	8500	8546	8591	
2	8637	8683	8728	8774	8819	8865	8911	8956	9002	9047	
3	9093	9138	9184	9230	9275	9321	9366	9412	9457	9503	
4	9548	9594	9639	9685	9730	9776	9821	9867	9912	9958	
955	98 0003	0049	0094	0140	0185	0231	0276	0322	0367	0412	
6	0458	0503	0549	0594	0640	0685	0730	0776	0821	0867	
7	0912	0957	1003	1048	1093	1139	1184	1229	1275	1320	
8	1366	1411	1456	1501	1547	1592	1637	1683	1728	1773	
9	1819	1864	1909	1954	2000	2045	2090	2135	2181	2226	
960	2271	2316	2362	2407	2452	2497	2543	2588	2633	2678	
1	2723	2769	2814	2859	2904	2949	2994	3040	3085	3130	
2	3175	3220	3265	3310	3356	3401	3446	3491	3536	3581	
3	3626	3671	3716	3762	3807	3852	3897	3942	3987	4032	
4	4077	4122	4167	4212	4257	4302	4347	4392	4437	4482	
965	4527	4572	4617	4662	4707	4752	4797	4842	4887	4932	45
6	4977	5022	5067	5112	5157	5202	5247	5292	5337	5382	
7	5426	5471	5516	5561	5606	5651	5696	5741	5786	5830	
8	5875	5920	5965	6010	6055	6100	6144	6189	6234	6279	
9	6324	6369	6413	6458	6503	6548	6593	6637	6682	6727	
970	6772	6817	6861	6906	6951	6996	7040	7085	7130	7175	
1	7219	7264	7309	7353	7398	7443	7488	7532	7577	7622	
2	7666	7711	7756	7800	7845	7890	7934	7979	8024	8068	
3	8113	8157	8202	8247	8291	8336	8381	8425	8470	8514	
4	8559	8604	8648	8693	8737	8782	8826	8871	8916	8960	
975	9005	9049	9094	9138	9183	9227	9272	9316	9361	9405	
6	9450	9494	9539	9583	9628	9672	9717	9761	9806	9850	
7	9895	9939	9983	0028	0072	0117	0161	0206	0250	0294	
8	99 0339	0383	0428	0472	0516	0561	0605	0650	0694	0738	
9	0783	0827	0871	0916	0960	1004	1049	1093	1137	1182	
980	1226	1270	1315	1359	1403	1448	1492	1536	1580	1625	
1	1669	1713	1758	1802	1846	1890	1935	1979	2023	2067	
2	2111	2156	2200	2244	2288	2333	2377	2421	2465	2509	
3	2554	2598	2642	2686	2730	2774	2819	2863	2907	2951	
4	2995	3039	3083	3127	3172	3216	3260	3304	3348	3392	
985	3436	3480	3524	3568	3613	3657	3701	3745	3789	3833	
6	3877	3921	3965	4009	4053	4097	4141	4185	4229	4273	
7	4317	4361	4405	4449	4493	4537	4581	4625	4669	4713	44
8	4757	4801	4845	4889	4933	4977	5021	5065	5108	5152	
9	5196	5240	5284	5328	5372	5416	5460	5504	5547	5591	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7

No. 990 Log. 995 — No. 999 Log. 999

N.	0	1	2	3	4	5	6	7	8	9	Diff.
990	99 5635	5679	5723	5767	5811	5854	5898	5942	5986	6030	
1	6074	6117	6161	6205	6249	6293	6337	6380	6424	6468	44
2	6512	6555	6599	6643	6687	6731	6774	6818	6862	6906	
3	6949	6993	7037	7080	7124	7168	7212	7255	7299	7343	
4	7386	7430	7474	7517	7561	7605	7648	7692	7736	7779	
995	7823	7867	7910	7954	7998	8041	8085	8129	8172	8216	
6	8259	8303	8347	8390	8434	8477	8521	8564	8608	8652	
7	8695	8739	8782	8826	8869	8913	8956	9000	9043	9087	
8	9131	9174	9218	9261	9305	9348	9392	9435	9479	9522	
9	9565	9609	9652	9696	9739	9783	9826	9870	9913	9957	43

VALUES OF *S*, *T*, AND *C* IN TABLE V, PAGES 52 AND 53

If we were to plot the values of the logarithmic functions given in Table V as ordinates and corresponding minutes as abscissas it would be found that the points for each function were on a curve with variable radius. It would further be noted that the curves for sines, tangents, and cotangents were of comparatively small radii when the angles were small; that the curves for cosines, cotangents, and tangents of angles near 90° respectively had the same shape as the curves for sines, tangents, and cotangents of the complements of the angles; and that other than the portions of the curves just mentioned were nearly straight lines for short distances.

When seconds are involved it will be sufficiently accurate to interpolate in the ordinary manner between adjacent values in the tables—or in other words, to assume that the curve joining two adjacent points is a straight line—for all functions between 2° and 88°, and also for sines of angles between 88° and 90° and for cosines of angles between 0° and 2°. The values in the columns headed *S*, *T*, and *C* provide a means (1) of accurately determining for any given angle between 0° and 2° the logarithmic sine, tangent, or cotangent, and for any given angle between 88° and 90°, the logarithmic cosine, cotangent, or tangent; or (2) for a given value of the logarithmic sine, tangent, or cotangent of accurately determining the angle when it lies between 0° and 2°, and for any given value of the cosine, cotangent, or tangent, the angle when it lies between 88° and 90°.

S, *T*, and *C* are logarithms. 10 is to be subtracted from them, as from all other logarithms in Table V.

Given: *angle.* *Required*: *logarithmic function.*

$$\left.\begin{aligned} \log \sin \alpha &= \log \alpha \text{ (in seconds)} + S \\ \log \tan \alpha &= \log \alpha \text{ (in seconds)} + T \\ \log \cot \alpha &= C - \log \alpha \text{ (in seconds)} \end{aligned}\right\} \text{In which } \alpha \text{ is less than } 2°.$$

$$\left.\begin{aligned} \log \cos \beta &= \log (90° - \beta) \text{ (in seconds)} + S \\ \log \tan \beta &= C - \log (90° - \beta) \text{ (in seconds)} \\ \log \cot \beta &= \log (90° - \beta) \text{ (in seconds)} + T \end{aligned}\right\} \text{In which } \beta \text{ lies between } 88° \text{ and } 90°.$$

Given: *logarithmic function.* *Required*: *angle.*

$$\left.\begin{aligned} \log \alpha \text{ (in seconds)} &= \log \sin \alpha - S \\ &= \log \tan \alpha - T \\ &= C - \log \cot \alpha \end{aligned}\right\} \text{In which } \alpha \text{ is less than } 2°.$$

$$\left.\begin{aligned} \log (90° - \beta) \text{ (in seconds)} &= \log \cos \beta - S \\ &= C - \log \tan \beta \\ &= \log \cot \beta - T \end{aligned}\right\} \text{In which } \beta \text{ lies between } 88° \text{ and } 90°.$$

Examples

Given: *angle.*

Required: *logarithmic function.*

$$\text{When } \left\{\begin{matrix} \alpha \\ 90° - \beta \end{matrix}\right\} = \begin{matrix} 19'\,22'' = \\ 1162'' \end{matrix}$$

$$\log 1162'' = 3.065206$$

$$S \text{ (for } 19') = 4.685573 - 10$$

$$\left.\begin{matrix} \log \alpha \\ \log \cos 89°\,40'\,38'' \end{matrix}\right\} = 7.750779 - 10$$

Given: *logarithmic function.*

Required: *angle.*

$$\text{When } \left\{\begin{matrix} \log \sin \alpha \\ \log \cos \beta \end{matrix}\right\} = 7.750779 - 10$$

$$S \text{ (for } 19') = 4.685573 - 10$$

$$\log \left\{\begin{matrix} \alpha \\ 90° - \beta \end{matrix}\right\} \text{ (in seconds)} = 3.065206$$

or

$$\alpha = 1162'' = 19'\,22''$$
$$\beta = 89°\,40'\,38''$$

$$\text{When } \left\{\begin{matrix} \alpha \\ 90° - \beta \end{matrix}\right\} = \begin{matrix} 23'\,21'' = \\ 1401'' \end{matrix}$$

$$\log 1401'' = 3.146438$$

$$C \text{ (for } 23') = 5.314419$$

$$\left.\begin{matrix} \log \cot 23'\,21'' \\ \log \tan 89°\,36'\,39'' \end{matrix}\right\} = 2.167981$$

$$\text{When } \left\{\begin{matrix} \log \cot \alpha \\ \log \tan \beta \end{matrix}\right\} = 2.167981$$

$$C \text{ (for } 23') = 5.314419$$

$$\log \left\{\begin{matrix} \alpha \\ 90° - \beta \end{matrix}\right\} \text{ (in seconds)} = 3.146438$$

or

$$\alpha = 1401'' = 23'\,21''$$
$$\beta = 89°\,36'\,39''$$

″	′	Sine.	S.*	T.*	Tang.	Cotang.	C.*	D. 1″.	Cosine.	′
			4.685				15.314			
0	**0**	Inf. neg.	575	575	Inf. neg.	Inf. pos.	425		**10.00 0000**	**60**
60	1	6.46 3726	575	575	6.46 3726	13.53 6274	425		0000	59
120	2	.76 4756	575	575	.76 4756	.23 5244	425		0000	58
180	3	6.94 0847	575	575	6.94 0847	13.05 9153	425		0000	57
240	4	7.06 5786	575	575	7.06 5786	12.93 4214	425		0000	56
300	**5**	**7.16 2696**	575	575	**7.16 2696**	**12.83 7304**	425	.02	**10.00 0000**	**55**
360	6	.24 1877	575	575	.24 1878	.75 8122	425	.00	9.99 9999	54
420	7	.30 8824	575	575	.30 8825	.69 1175	425	.00	9999	53
480	8	.36 6816	574	576	.36 6817	.63 3183	424	.00	9999	52
540	9	.41 7968	574	576	.41 7970	.58 2030	424	.02	9999	51
600	**10**	**7.46 3726**	574	576	**7.46 3727**	**12.53 6273**	424	.00	**9.99 9998**	**50**
660	11	.50 5118	574	576	.50 5120	.49 4880	424	.02	9998	49
720	12	.54 2906	574	577	.54 2909	.45 7091	423	.00	9997	48
780	13	.57 7668	574	577	.57 7672	.42 2328	423	.02	9997	47
840	14	.60 9853	574	577	.60 9857	.39 0143	423	.00	9996	46
900	**15**	**7.63 9816**	573	578	**7.63 9820**	**12.36 0180**	422	.02	**9.99 9996**	**45**
960	16	.66 7845	573	578	.66 7849	.33 2151	422	.00	9995	44
1020	17	.69 4173	573	578	.69 4179	.30 5821	422	.02	9995	43
1080	18	.71 8997	573	579	.71 9003	.28 0997	421	.02	9994	42
1140	19	.74 2478	573	579	.74 2484	.25 7516	421	.00	9993	41
1200	**20**	**7.76 4754**	572	580	**7.76 4761**	**12.23 5239**	420	.02	**9.99 9993**	**40**
1260	21	.78 5943	572	580	.78 5951	.21 4049	420	.02	9992	39
1320	22	.80 6146	572	581	.80 6155	.19 3845	419	.02	9991	38
1380	23	.82 5451	572	581	.82 5460	.17 4540	419	.02	9990	37
1440	24	.84 3934	571	582	.84 3944	.15 6056	418	.00	9989	36
1500	**25**	**7.86 1682**	571	583	**7.86 1674**	**12.13 8326**	417	.02	**9.99 9989**	**35**
1560	26	.87 8695	571	583	.87 8708	.12 1292	417	.02	9988	34
1620	27	.89 5085	570	584	.89 5099	.10 4901	416	.02	9987	33
1680	28	.91 0879	570	584	.91 0894	.08 9106	416	.02	9986	32
1740	29	.92 6119	570	585	.92 6134	.07 3866	415	.03	9985	31
1800	**30**	**7.94 0842**	569	586	**7.94 0858**	**12.05 9142**	414	.02	**9.99 9983**	**30**
1860	31	.95 5082	569	587	.95 5100	.04 4900	413	.02	9982	29
1920	32	.96 8870	569	587	.96 8889	.03 1111	413	.02	9981	28
1980	33	.98 2233	568	588	.98 2250	.01 7747	412	.02	9980	27
2040	34	7.99 5198	568	589	7.99 5219	12.00 4781	411	.03	9979	26
2100	**35**	**8.00 7787**	567	590	**8.00 7809**	**11.99 2191**	410	.02	**9.99 9977**	**25**
2160	36	.02 0021	567	591	.02 0044	.97 9956	409	.02	9976	24
2220	37	.03 1919	566	592	.03 1945	.96 8055	408	.03	9975	23
2280	38	.04 3501	566	593	.04 3527	.95 6473	407	.02	9973	22
2340	39	.05 4781	566	593	.05 4809	.94 5191	407	.02	9972	21
2400	**40**	**8.06 5776**	565	594	**8.06 5806**	**11.93 4194**	406	.03	**9.99 9971**	**20**
2460	41	.07 6500	565	595	.07 6531	.92 3469	405	.02	9969	19
2520	42	.08 6965	564	596	.08 6997	.91 3003	404	.03	9968	18
2580	43	.09 7183	564	598	.09 7217	.90 2783	402	.03	9966	17
2640	44	.10 7167	563	599	.10 7203	.89 2797	401	.02	9964	16
2700	**45**	**8.11 6926**	562	600	**8.11 6963**	**11.88 3037**	400	.03	**9.99 9963**	**15**
2760	46	.12 6471	562	601	.12 6510	.87 3490	399	.03	9961	14
2820	47	.13 5810	561	602	.13 5851	.86 4149	398	.02	9959	13
2880	48	.14 4953	561	603	.14 4996	.85 5004	397	.03	9958	12
2940	49	.15 3907	560	604	.15 3952	.84 6048	396	.03	9956	11
3000	**50**	**8.16 2681**	560	605	**8.16 2727**	**11.83 7273**	395	.03	**9.99 9954**	**10**
3060	51	.17 1280	559	607	.17 1328	.82 8672	393	.03	9952	9
3120	52	.17 9713	558	608	.17 9763	.82 0237	392	.03	9950	8
3180	53	.18 7985	558	609	.18 8036	.81 1964	391	.03	9948	7
3240	54	.19 6102	557	611	.19 6156	.80 3844	389	.03	9946	6
3300	**55**	**8.20 4070**	556	612	**8.20 4126**	**11.79 5874**	388	.03	**9.99 9944**	**5**
3360	56	.21 1895	556	613	.21 1953	.78 8047	387	.03	9942	4
3420	57	.21 9581	555	615	.21 9641	.78 0359	385	.03	9940	3
3480	58	.22 7134	554	616	.22 7195	.77 2805	384	.03	9938	2
3540	59	.23 4557	554	618	.23 4621	.76 5379	382	.03	9936	1
3600	**60**	**8.24 1855**	553	619	**8.24 1921**	**11.75 8079**	381		**9.99 9934**	**0**
			4.685				15.314			
″	′	Cosine.	S.*	T.*	Cotang.	Tang.	**C.***	D. 1″.	Sine.	′

90° 89°

*For use of S. T. and C see page 50.

1° 178°

″	′	Sine.	S.*	T.*	Tang.	Cotang.	C.*	D. 1″.	Cosine.	′
			4.685				15.314			
3600	0	8.24 1855	553	619	8.24 1921	11.75 8079	381	.03	9.99 9934	60
3660	1	.24 9033	552	620	.24 9102	.75 0898	380	.05	9932	59
3720	2	.25 6094	551	622	.25 6165	.74 3835	378	.03	9929	58
3780	3	.26 3042	551	623	.26 3115	.73 6885	377	.03	9927	57
3840	4	.26 9881	550	625	.26 9956	.73 0044	375	.05	9925	56
3900	5	8.27 6614	549	627	8.27 6691	11.72 3309	373	.03	9.99 9922	55
3960	6	.28 3243	548	628	.28 3323	.71 6677	372	.03	9920	54
4020	7	.28 9773	547	630	.28 9856	.71 0144	370	.05	9918	53
4080	8	.29 6207	546	632	.29 6292	.70 3708	368	.03	9915	52
4140	9	.30 2546	546	633	.30 2634	.69 7366	367	.05	9913	51
4200	10	8.30 8794	545	635	8.30 8884	11.69 1116	365	.05	9.99 9910	50
4260	11	.31 4954	544	637	.31 5046	.68 4954	363	.03	9907	49
4320	12	.32 1027	543	638	.32 1122	.67 8878	362	.05	9905	48
4380	13	.32 7016	542	640	.32 7114	.67 2886	360	.05	9902	47
4440	14	.33 2924	541	642	.33 3025	.66 6975	358	.03	9399	46
4500	15	8.33 8753	540	644	8.33 8856	11.66 1144	356	.05	9.99 9897	45
4560	16	.34 4504	539	646	.34 4610	.65 5390	354	.05	9394	44
4620	17	.35 0181	539	648	.35 0289	.64 9711	352	.05	9891	43
4680	18	.35 5783	538	649	.35 5895	.64 4105	351	.05	9888	42
4740	19	.36 1315	537	651	.36 1430	.63 8570	349	.05	9885	41
4800	20	8.36 6777	536	653	8.36 6895	11.63 3105	347	.05	9.99 9882	40
4860	21	.37 2171	535	655	.37 2292	.62 7708	345	.05	9879	39
4920	22	.37 7499	534	657	.37 7622	.62 2378	343	.05	9876	38
4980	23	.38 2762	533	659	.38 2889	.61 7111	341	.05	9873	37
5040	24	.38 7962	532	661	.38 8092	.61 1908	339	.05	9870	36
5100	25	8.39 3101	531	663	8.39 3234	11.60 6766	337	.05	9.99 9867	35
5160	26	.39 8179	530	666	.39 8315	.60 1685	334	.05	9864	34
5220	27	.40 3199	529	668	.40 3338	.59 6662	332	.05	9861	33
5280	28	.40 8161	527	670	.40 8304	.59 1696	330	.07	9358	32
5340	29	.41 3068	526	672	.41 3213	.58 6787	328	.05	9854	31
5400	30	8.41 7919	525	674	8.41 8068	11.58 1932	326	.05	9.99 9851	30
5460	31	.42 2717	524	676	.42 2869	.57 7131	324	.07	9848	29
5520	32	.42 7462	523	679	.42 7618	.57 2382	321	.05	9844	28
5580	33	.43 2156	522	681	.43 2315	.56 7685	319	.05	9841	27
5640	34	.43 6800	521	683	.43 6962	.56 3038	317	.07	9838	26
5700	35	8.44 1394	520	685	8.44 1560	11.55 8440	315	.05	9.99 9834	25
5760	36	.44 5941	518	688	.44 6110	.55 3890	312	.07	9831	24
5820	37	.45 0440	517	690	.45 0613	.54 9387	310	.05	9827	23
5880	38	4893	516	693	5070	4930	307	.07	9824	22
5940	39	.45 9301	515	695	.45 9481	.54 0519	305	.07	3820	21
6000	40	8.46 3665	514	697	8.46 3849	11.53 6151	303	.05	9.99 9816	20
6060	41	.46 7985	512	700	.46 8172	.53 1828	300	.07	9313	19
6120	42	.47 2263	511	702	.47 2454	.52 7546	298	.07	9309	18
6180	43	.47 6498	510	705	.47 6693	.52 3307	295	.07	9305	17
6240	44	.48 0693	509	707	.48 0892	.51 9108	293	.07	9301	16
6300	45	8.48 4848	507	710	8.48 5050	11.51 4950	290	.05	9.99 9797	15
6360	46	.48 8963	506	713	.48 9170	.51 0830	287	.07	9794	14
6420	47	.49 3040	505	715	.49 3250	.50 6750	285	.07	9790	13
6480	48	.49 7078	503	718	.49 7293	.50 2707	282	.07	9786	12
6540	49	.50 1080	502	720	.50 1298	.49 8702	280	.07	9782	11
6600	50	8.50 5045	501	723	8.50 5267	11.49 4733	277	.07	9.99 9778	10
6660	51	.50 8974	499	726	.50 9200	.49 0800	274	.08	9774	9
6720	52	.51 2867	498	729	.51 3098	.48 6902	271	.07	9769	8
6780	53	.51 6726	497	731	.51 6961	.48 3039	269	.07	9765	7
6840	54	.52 0551	495	734	.52 0790	.47 9210	266	.07	9761	6
6900	55	8.52 4343	494	737	8.52 4586	11.47 5414	263	.07	9.99 9757	5
6960	56	.52 8102	492	740	.52 8349	.47 1651	260	.08	9753	4
7020	57	.53 1828	491	743	.53 2080	.46 7920	257	.07	9748	3
7080	58	5523	490	745	5779	4221	255	.07	9744	2
7140	59	.53 9186	488	748	.53 9447	.46 0553	252	.08	9740	1
7200	60	8.54 2819	487	751	8.54 3084	11.45 6916	249		9.99 9735	0
			4.685				15.314			
″	′	Cosine.	S.*	T.*	Cotang.	Tang.	C.*	D. 1″.	Sine.	′

91° 88°

*For use of S. T. and C see page 50.

2° 177°

′	Sine.	D. 1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**8.54 2819**	60.05	**9.99 9735**	.07	**8.54 3084**	60.12	**11.45 6916**	**60**
1	6422	59.55	9731	.08	.54 6691	59.62	.45 3309	59
2	.54 9995	59.07	9726	.07	.55 0268	59.15	.44 9732	58
3	.55 3539	58.58	9722	.08	3817	58.65	6183	57
4	.55 7054	58.10	9717	.07	.55 7336	58.20	.44 2664	56
5	**8.56 0540**	57.65	**9.99 9713**	.08	**8.56 0828**	57.72	**11.43 9172**	**55**
6	3999	57.20	9708	.07	4291	57.27	5709	54
7	.56 7431	56.75	9704	.08	.56 7727	56.83	.43 2273	53
8	.57 0836	56.30	9699	.08	.57 1137	56.38	.42 8863	52
9	4214	55.87	9694	.08	4520	55.95	5480	51
10	**8.57 7566**	55.43	**9.99 9689**	.07	**8.57 7877**	55.52	**11.42 2123**	**50**
11	.58 0892	55.02	9685	.08	.58 1208	55.10	.41 8792	49
12	4193	54.60	9680	.08	4514	54.68	5486	48
13	.58 7469	54.20	9675	.08	.58 7795	54.27	.41 2205	47
14	.59 0721	53.78	9670	.08	.59 1051	53.87	.40 8949	46
15	**8.59 3948**	53.40	**9.99 9665**	.08	**8.59 4283**	53.48	**11.40 5717**	**45**
16	.59 7152	53.00	9660	.08	.59 7492	53.08	.40 2508	44
17	.60 0332	52.62	9655	.08	.60 0677	52.70	.39 9323	43
18	3489	52.23	9650	.08	3839	52.32	6161	42
19	6623	51.85	9645	.08	.60 6978	51.93	.39 3022	41
20	**8.60 9734**	51.48	**9.99 9640**	.08	**8.61 0094**	51.58	**11.38 9906**	**40**
21	.61 2823	51.13	9635	.10	3189	51.22	6811	39
22	5891	50.77	9629	.08	6262	50.85	3738	38
23	.61 8937	50.42	9624	.08	.61 9313	50.50	.38 0687	37
24	.62 1962	50.05	9619	.08	.62 2343	50.15	.37 7657	36
25	**8.62 4965**	49.72	**9.99 9614**	.10	**8.62 5352**	49.80	**11.37 4648**	**35**
26	.62 7948	49.38	9608	.08	.62 8340	49.47	.37 1660	34
27	.63 0911	49.05	9603	.10	.63 1308	49.13	.36 8692	33
28	3854	48.70	9597	.08	4256	48.80	5744	32
29	6776	48.40	9592	.10	.63 7184	48.48	.36 2816	31
30	**8.63 9680**	48.05	**9.99 9586**	.08	**8.64 0093**	48.15	**11.35 9907**	**30**
31	.64 2563	47.75	9581	.10	2982	47.85	7018	29
32	5428	47.43	9575	.08	5853	47.52	4147	28
33	.64 8274	47.13	9570	.10	.64 8704	47.22	.35 1296	27
34	.65 1102	46.82	9564	.10	.65 1537	46.92	.34 8463	26
35	**8.65 3911**	46.52	**9.99 9558**	.08	**8.65 4352**	46.62	**11.34 5648**	**25**
36	6702	46.22	9553	.10	7149	46.32	2851	24
37	.65 9475	45.92	9547	.10	.65 9928	46.02	.34 0072	23
38	.66 2230	45.63	9541	.10	.66 2689	45.73	.33 7311	22
39	4968	45.35	9535	.10	5433	45.45	4567	21
40	**8.66 7689**	45.07	**9.99 9529**	.08	**8.66 8160**	45.17	**11.33 1840**	**20**
41	.67 0393	44.78	9524	.10	.67 0870	44.88	.32 9130	19
42	3080	44.52	9518	.10	3563	44.60	6437	18
43	5751	44.23	9512	.10	6239	44.35	3761	17
44	.67 8405	43.97	9506	.10	.67 8900	44.07	.32 1100	16
45	**8.68 1043**	43.70	**9.99 9500**	.12	**8.68 1544**	43.80	**11.31 8456**	**15**
46	3665	43.45	9493	.10	4172	43.53	5828	14
47	6272	43.18	9487	.10	6784	43.28	3216	13
48	.68 8863	42.92	9481	.10	.68 9381	43.03	.31 0619	12
49	.69 1438	42.67	9475	.10	.69 1963	42.77	.30 8037	11
50	**8.69 3998**	42.42	**9.99 9469**	.10	**8.69 4529**	42.53	**11.30 5471**	**10**
51	6543	42.17	9463	.12	7081	42.27	2919	9
52	.69 9073	41.93	9456	.10	.69 9617	42.03	.30 0383	8
53	.70 1589	41.68	9450	.12	.70 2139	41.78	.29 7861	7
54	4090	41.45	9443	.10	4646	41.57	5354	6
55	**8.70 6577**	41.20	**9.99 9437**	.10	**8.70 7140**	41.30	**11.29 2860**	**5**
56	.70 9049	40.97	9431	.12	.70 9618	41.08	.29 0382	4
57	.71 1507	40.75	9424	.10	.71 2083	40.85	.28 7917	3
58	3952	40.52	9418	.12	4534	40.63	5466	2
59	6383	40.28	9411	.12	6972	40.40	3028	1
60	**8.71 8800**		**9.99 9404**	.12	**8.71 9396**		**11.28 0604**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

92° 87°

3° 176°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**8.71 8800**	40.07	**9.99 9404**	.10	**8.71 9396**	40.17	**11.28 0604**	60
1	.72 1204	39.85	9398	.12	.72 1806	39.97	.27 8194	59
2	3595	39.62	9391	.12	4204	39.73	5796	58
3	5972	39.42	9384	.12	6588	39.52	3412	57
4	.72 8337	39.18	9378	.12	.72 8959	39.30	.27 1041	56
5	**8.73 0688**	38.98	**9.99 9371**	.12	**8.73 1317**	39.10	**11.26 8683**	55
6	3027	38.78	9364	.12	3663	38.88	6337	54
7	5354	38.55	9357	.12	5996	38.68	4004	53
8	7667	38.37	9350	.12	.73 8317	38.48	.26 1683	52
9	.73 9969	38.17	9343	.12	.74 0626	38.27	.25 9374	51
10	**8.74 2259**	37.95	**9.99 9336**	.12	**8.74 2922**	38.08	**11.25 7078**	50
11	4536	37.77	9329	.12	5207	37.87	4793	49
12	6802	37.55	9322	.12	7479	37.68	2521	48
13	.74 9055	37.37	9315	.12	.74 9740	37.48	.25 0260	47
14	.75 1297	37.18	9308	.12	.75 1989	37.30	.24 8011	46
15	**8.75 3528**	36.98	**9.99 9301**	.12	**8.75 4227**	37.10	**11.24 5773**	45
16	5747	36.80	9294	.12	6453	36.92	3547	44
17	.75 7955	36.60	9287	.13	.75 8668	36.73	.24 1332	43
18	.76 0151	36.43	9279	.12	.76 0872	36.55	.23 9128	42
19	2337	36.23	9272	.12	3065	36.35	6935	41
20	**8.76 4511**	36.07	**9.99 9265**	.13	**8.76 5246**	36.18	**11.23 4754**	40
21	6675	35.88	9257	.12	7417	36.02	2583	39
22	.76 8828	35.70	9250	.13	.76 9578	35.82	.23 0422	38
23	.77 0970	35.52	9242	.12	.77 1727	35.65	.22 8273	37
24	3101	35.37	9235	.13	3866	35.48	6134	36
25	**8.77 5223**	35.17	**9.99 9227**	.12	**8.77 5995**	35.32	**11.22 4005**	35
26	7333	35.02	9220	.13	.77 8114	35.13	.22 1886	34
27	.77 9434	34.83	9212	.12	.78 0222	34.97	.21 9778	33
28	.78 1524	34.68	9205	.13	2320	34.80	7680	32
29	3605	34.50	9197	.13	4408	34.63	5592	31
30	**8.78 5675**	34.35	**9.99 9189**	.13	**8.78 6486**	34.47	**11.21 3514**	30
31	7736	34.18	9181	.12	.78 8554	34.32	.21 1446	29
32	.78 9787	34.02	9174	.13	.79 0613	34.15	.20 9387	28
33	.79 1828	33.85	9166	.13	2662	33.98	7338	27
34	3859	33.70	9158	.13	4701	33.83	5299	26
35	**8.79 5881**	33.55	**9.99 9150**	.13	**8.79 6731**	33.68	**11.20 3269**	25
36	7894	33.38	9142	.13	.79 8752	33.52	.20 1248	24
37	.79 9897	33.25	9134	.13	.80 0763	33.37	.19 9237	23
38	.80 1892	33.07	9126	.13	2765	33.22	7235	22
39	3876	32.93	9118	.13	4758	33.07	5242	21
40	**8.80 5852**	32.78	**9.99 9110**	.13	**8.80 6742**	32.92	**11.19 3258**	20
41	7819	32.63	9102	.13	.80 8717	32.77	.19 1283	19
42	.80 9777	32.48	9094	.13	.81 0683	32.63	.18 9317	18
43	.81 1726	32.35	9086	.13	2641	32.47	7359	17
44	3667	32.20	9077	.15	4589	32.33	5411	16
45	**8.81 5599**	32.05	**9.99 9069**	.13	**8.81 6529**	32.20	**11.18 3471**	15
46	7522	31.90	9061	.13	.81 8461	32.05	.18 1539	14
47	.81 9436	31.78	9053	.13	.82 0384	31.90	.17 9616	13
48	.82 1343	31.62	9044	.15	2298	31.78	7702	12
49	3240	31.50	9036	.13	4205	31.63	5795	11
50	**8.82 5130**	31.35	**9.99 9027**	.13	**8.82 6103**	31.48	**11.17 3897**	10
51	7011	31.22	9019	.15	7992	31.37	2008	9
52	.82 8884	31.08	9010	.13	.82 9874	31.23	.17 0126	8
53	.83 0749	30.97	9002	.15	.83 1748	31.08	.16 8252	7
54	2607	30.82	8993	.15	3613	30.97	6387	6
55	**8.83 4456**	30.68	**9.99 8984**	.13	**8.83 5471**	30.83	**11.16 4529**	5
56	6297	30.55	8976	.15	7321	30.70	2679	4
57	8130	30.43	8967	.15	.83 9163	30.58	.16 0837	3
58	.83 9956	30.30	8958	.13	.84 0998	30.45	.15 9002	2
59	.84 1774	30.18	8950	.15	2825	30.32	7175	1
60	**8.84 3585**		**9.99 8941**	.15	**8.84 4644**		**11.15 5356**	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

93° 86°

4° 175°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**8.84 3585**		**9.99 8941**	.15	**8.84 4644**		**11.15 5356**	**60**
1	5387	30.03	8932	.15	6455	30.18	3545	59
2	7183	29.93	8923	.15	.84 8260	30.08	.15 1740	58
3	.84 8971	29.80	8914	.15	.85 0057	29.95	.14 9943	57
4	.85 0751	29.67	8905	.15	1846	29.82	8154	56
5	**8.85 2525**	29.57	**9.99 8896**	.15	**8.85 3628**	29.70	**11.14 6372**	**55**
6	4291	29.43	8887	.15	5403	29.58	4597	54
7	6049	29.30	8878	.15	7171	29.47	2829	53
8	7801	29.20	8869	.15	.85 8932	29.35	.14 1068	52
9	.85 9546	29.08	8860	.15	.86 0686	29.23	.13 9314	51
10	**8.86 1283**	28.95	**9.99 8851**	.17	**8.86 2433**	29.12	**11.13 7567**	**50**
11	3014	28.85	8841	.15	4173	29.00	5827	49
12	4738	28.73	8832	.15	5906	28.88	4094	48
13	6455	28.62	8823	.15	7632	28.77	2368	47
14	8165	28.50	8813	.17	.86 9351	28.65	.13 0649	46
15	**8.86 9868**	28.38	**9.99 8804**	.15	**8.87 1064**	28.55	**11.12 8936**	**45**
16	.87 1565	28.28	8795	.17	2770	28.43	7230	44
17	3255	28.17	8785	.15	4469	28.32	5531	43
18	4938	28.05	8776	.17	6162	28.22	3838	42
19	6615	27.95	8766	.15	7849	28.12	2151	41
20	**8.87 8285**	27.83	**9.99 8757**	.17	**8.87 9529**	28.00	**11.12 0471**	**40**
21	.87 9949	27.73	8747	.15	.88 1202	27.88	.11 8798	39
22	.88 1607	27.63	8738	.17	2869	27.78	7131	38
23	3258	27.52	8728	.17	4530	27.68	5470	37
24	4903	27.42	8718	.17	6185	27.58	3815	36
25	**8.88 6542**	27.32	**9.99 8708**	.15	**8.88 7833**	27.47	**11.11 2167**	**35**
26	8174	27.20	8699	.17	.88 9476	27.38	.11 0524	34
27	.88 9801	27.12	8689	.17	.89 1112	27.27	.10 8888	33
28	.89 1421	27.00	8679	.17	2742	27.17	7258	32
29	3035	26.90	8669	.17	4366	27.07	5634	31
30	**8.89 4643**	26.80	**9.99 8659**	.17	**8.89 5984**	26.97	**11.10 4016**	**30**
31	6246	26.72	8649	.17	7596	26.87	2404	29
32	7842	26.60	8639	.17	.89 9203	26.78	.10 0797	28
33	.89 9432	26.50	8629	.17	.90 0803	26.67	.09 9197	27
34	.90 1017	26.42	8619	.17	2398	26.58	7602	26
35	**8.90 2596**	26.32	**9.99 8609**	.17	**8.90 3987**	26.48	**11.09 6013**	**25**
36	4169	26.22	8599	.17	5570	26.38	4430	24
37	5736	26.12	8589	.17	7147	26.28	2853	23
38	7297	26.02	8578	.18	.90 8719	26.20	.09 1281	22
39	.90 8853	25.93	8568	.17	.91 0285	26.10	.08 9715	21
40	**8.91 0404**	25.85	**9.99 8558**	.17	**8.91 1846**	26.02	**11.08 8154**	**20**
41	1949	25.75	8548	.17	3401	25.92	6599	19
42	3488	25.65	8537	.18	4951	25.83	5049	18
43	5022	25.57	8527	.17	6495	25.73	3505	17
44	6550	25.47	8516	.18	8034	25.63	1966	16
45	**8.91 8073**	25.38	**9.99 8506**	.17	**8.91 9568**	25.57	**11.08 0432**	**15**
46	.91 9591	25.30	8495	.18	.92 1096	25.47	.07 8904	14
47	.92 1103	25.20	8485	.17	2619	25.38	7381	13
48	2610	25.12	8474	.18	4136	25.28	5864	12
49	4112	25.03	8464	.17	5649	25.22	4351	11
50	**8.92 5609**	24.95	**9.99 8453**	.18	**8.92 7156**	25.12	**11.07 2844**	**10**
51	7100	24.85	8442	.18	.92 8658	25.03	.07 1342	9
52	.92 8587	24.78	8431	.18	.93 0155	24.95	.06 9845	8
53	.93 0068	24.68	8421	.17	1647	24.87	8353	7
54	1544	24.60	8410	.18	3134	24.78	6866	6
55	**8.93 3015**	24.52	**9.99 8399**	.18	**8.93 4616**	24.70	**11.06 5384**	**5**
56	4481	24.43	8388	.18	6093	24.62	3907	4
57	5942	24.35	8377	.18	7565	24.53	2435	3
58	7398	24.27	8366	.18	.93 9032	24.45	.06 0968	2
59	.93 8850	24.20	8355	.18	.94 0494	24.37	.05 9506	1
60	**8.94 0296**	24.10	**9.99 8344**	.18	**8.94 1952**	24.30	**11.05 8048**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

94° 85°

5° 174°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	8.94 0296	24.03	9.99 8344	.18	8.94 1952	24.20	11.05 8048	60
1	1738	23.93	8333	.18	3404	24.13	6596	59
2	3174	23.87	8322	.18	4852	24.05	5148	58
3	4606	23.80	8311	.18	6295	23.98	3705	57
4	6034	23.70	8300	.18	7734	23.90	2266	56
5	8.94 7456	23.63	9.99 8289	.20	8.94 9168	23.82	11.05 0832	55
6	.94 8874	23.55	8277	.18	.95 0597	23.73	.04 9403	54
7	.95 0287	23.48	8266	.18	2021	23.67	7979	53
8	1696	23.40	8255	.20	3441	23.58	6559	52
9	3100	23.32	8243	.18	4856	23.52	5144	51
10	8.95 4499	23.25	9.99 8232	.20	8.95 6267	23.45	11.04 3733	50
11	5894	23.17	8220	.18	7674	23.35	2326	49
12	7284	23.10	8209	.20	.95 9075	23.30	.04 0925	48
13	.95 8670	23.03	8197	.18	.96 0473	23.22	.03 9527	47
14	.96 0052	22.95	8186	.20	1866	23.15	8134	46
15	8.96 1429	22.87	9.99 8174	.18	8.96 3255	23.07	11.03 6745	45
16	2801	22.82	8163	.20	4639	23.00	5361	44
17	4170	22.73	8151	.20	6019	22.92	3981	43
18	5534	22.65	8139	.18	7394	22.87	2606	42
19	6893	22.60	8128	.20	.96 8766	22.78	.03 1234	41
20	8.96 8249	22.52	9.99 8116	.20	8.97 0133	22.72	11.02 9867	40
21	.96 9600	22.45	8104	.20	1496	22.65	8504	39
22	.97 0947	22.37	8092	.20	2855	22.57	7145	38
23	2289	22.32	8080	.20	4209	22.52	5791	37
24	3628	22.23	8068	.20	5560	22.43	4440	36
25	8.97 4962	22.18	9.99 8056	.20	8.97 6906	22.37	11.02 3094	35
26	6293	22.10	8044	.20	8248	22.30	1752	34
27	7619	22.03	8032	.20	.97 9586	22.25	.02 0414	33
28	.97 8941	21.97	8020	.20	.98 0921	22.17	.01 9079	32
29	.98 0259	21.90	8008	.20	2251	22.10	7749	31
30	8.98 1573	21.83	9.99 7996	.20	8.98 3577	22.03	11.01 6423	30
31	2883	21.77	7984	.20	4899	21.97	5101	29
32	4189	21.72	7972	.22	6217	21.92	3783	28
33	5491	21.63	7959	.20	7532	21.83	2468	27
34	6789	21.57	7947	.20	.98 8842	21.78	.01 1158	26
35	8.98 8083	21.52	9.99 7935	.22	8.99 0149	21.70	11.00 9851	25
36	.98 9374	21.43	7922	.20	1451	21.65	8549	24
37	.99 0660	21.38	7910	.22	2750	21.58	7250	23
38	1943	21.32	7897	.20	4045	21.53	5955	22
39	3222	21.25	7885	.22	5337	21.45	4663	21
40	8.99 4497	21.18	9.99 7872	.20	8.99 6624	21.40	11.00 3376	20
41	5768	21.13	7860	.22	7908	21.33	2092	19
42	7036	21.05	7847	.20	8.99 9188	21.28	11.00 0812	18
43	8299	21.02	7835	.22	9.00 0465	21.22	10.99 9535	17
44	8.99 9560	20.93	7822	.22	1738	21.15	8262	16
45	9.00 0816	20.88	9.99 7809	.20	9.00 3007	21.08	10.99 6993	15
46	2069	20.82	7797	.22	4272	21.03	5728	14
47	3318	20.75	7784	.22	5534	20.97	4466	13
48	4563	20.70	7771	.22	6792	20.92	3208	12
49	5805	20.65	7758	.22	8047	20.85	1953	11
50	9.00 7044	20.57	9.99 7745	.22	9.00 9298	20.80	10.99 0702	10
51	8278	20.53	7732	.22	.01 0546	20.73	.98 9454	9
52	.00 9510	20.45	7719	.22	1790	20.68	8210	8
53	.01 0737	20.42	7706	.22	3031	20.62	6969	7
54	1962	20.33	7693	.22	4268	20.57	5732	6
55	9.01 3182	20.30	9.99 7680	.22	9.01 5502	20.50	10.98 4498	5
56	4400	20.22	7667	.22	6732	20.45	3268	4
57	5613	20.18	7654	.22	7959	20.40	2041	3
58	6824	20.12	7641	.22	.01 9183	20.33	.98 0817	2
59	8031	20.07	7628	.23	.02 0403	20.28	.97 9597	1
60	9.01 9235		9.99 7614		9.02 1620		10.97 8380	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

95° 84°

6° 173°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.01 9235**		**9.99 7614**		**9.02 1620**		**10.97 8380**	**60**
1	.02 0435	20.00	7601	.22	2834	20.23	7166	59
2	1632	19.95	7588	.22	4044	20.17	5956	58
3	2825	19.88	7574	.23	5251	20.12	4749	57
4	4016	19.85	7561	.22	6455	20.07	3545	56
5	**9.02 5203**	19.78	**9.99 7547**	.23	**9.02 7655**	20.00	**10.97 2345**	**55**
6	6386	19.72	7534	.22	.02 8852	19.95	.97 1148	54
7	7567	19.68	7520	.23	.03 0046	19.90	.96 9954	53
8	8744	19.62	7507	.22	1237	19.85	8763	52
9	.02 9918	19.57	7493	.23	2425	19.80	7575	51
10	**9.03 1089**	19.52	**9.99 7480**	.22	**9.03 3609**	19.73	**10.96 6391**	**50**
11	2257	19.47	7466	.23	4791	19.70	5209	49
12	3421	19.40	7452	.23	5969	19.63	4031	48
13	4582	19.35	7439	.22	7144	19.58	2856	47
14	5741	19.32	7425	.23	8316	19.53	1684	46
15	**9.03 6896**	19.25	**9.99 7411**	.23	**9.03 9485**	19.48	**10.96 0515**	**45**
16	8048	19.20	7397	.23	.04 0651	19.43	.95 9349	44
17	.03 9197	19.15	7383	.23	1813	19.37	8187	43
18	.04 0342	19.08	7369	.23	2973	19.33	7027	42
19	1485	19.05	7355	.23	4130	19.28	5870	41
20	**9.04 2625**	19.00	**9.99 7341**	.23	**9.04 5284**	19.23	**10.95 4716**	**40**
21	3762	18.95	7327	.23	6434	19.17	3566	39
22	4895	18.88	7313	.23	7582	19.13	2418	38
23	6026	18.85	7299	.23	8727	19.08	1273	37
24	7154	18.80	7285	.23	.04 9869	19.03	.95 0131	36
25	**9.04 8279**	18.75	**9.99 7271**	.23	**9.05 1008**	18.98	**10.94 8992**	**35**
26	.04 9400	18.68	7257	.23	2144	18.93	7856	34
27	.05 0519	18.65	7242	.25	3277	18.88	6723	33
28	1635	18.60	7228	.23	4407	18.83	5593	32
29	2749	18.57	7214	.23	5535	18.80	4465	31
30	**9.05 3859**	18.50	**9.99 7199**	.25	**9.05 6659**	18.73	**10.94 3341**	**30**
31	4966	18.45	7185	.23	7781	18.70	2219	29
32	6071	18.42	7170	.25	.05 8900	18.65	.94 1100	28
33	7172	18.35	7156	.23	.06 0016	18.60	.93 9984	27
34	8271	18.32	7141	.25	1130	18.57	8870	26
35	**9.05 9367**	18.27	**9.99 7127**	.23	**9.06 2240**	18.50	**10.93 7760**	**25**
36	.06 0460	18.22	7112	.25	3348	18.47	6652	24
37	1551	18.18	7098	.23	4453	18.42	5547	23
38	2639	18.13	7083	.25	5556	18.38	4444	22
39	3724	18.08	7068	.25	6655	18.32	3345	21
40	**9.06 4806**	18.03	**9.99 7053**	.25	**9.06 7752**	18.28	**10.93 2248**	**20**
41	5885	17.98	7039	.23	8846	18.25	1154	19
42	6962	17.95	7024	.25	.06 9938	18.20	.93 0062	18
43	8036	17.90	7009	.25	.07 1027	18.15	.92 8973	17
44	.06 9107	17.85	6994	.25	2113	18.10	7887	16
45	**9.07 0176**	17.82	**9.99 6979**	.25	**9.07 3197**	18.07	**10.92 6803**	**15**
46	1242	17.77	6964	.25	4278	18.02	5722	14
47	2306	17.73	6949	.25	5356	17.97	4644	13
48	3366	17.67	6934	.25	6432	17.93	3568	12
49	4424	17.63	6919	.25	7505	17.88	2495	11
50	**9.07 5480**	17.60	**9.99 6904**	.25	**9.07 8576**	17.85	**10.92 1424**	**10**
51	6533	17.55	6889	.25	.07 9644	17.80	.92 0356	9
52	7583	17.50	6874	.27	.08 0710	17.77	.91 9290	8
53	8631	17.47	6858	.25	1773	17.72	8227	7
54	.07 9676	17.42	6843	.27	2833	17.67	7167	6
55	**9.08 0719**	17.38	**9.99 6828**	.27	**9.08 3891**	17.63	**10.91 6109**	**5**
56	1759	17.33	6812	.25	4947	17.60	5053	4
57	2797	17.30	6797	.25	6000	17.55	4000	3
58	3832	17.25	6782	.27	7050	17.50	2950	2
59	4864	17.20	6766	.27	8098	17.47	1902	1
60	**9.08 5894**	17.17	**9.99 6751**	.25	**9.08 9144**	17.43	**10.91 0856**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

96° 83°

7° 172°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.08 5894**		**9.99 6751**	.27	**9.08 9144**	17.38	**10.91 0856**	**60**
1	6922	17.13	6735	.25	.09 0187	17.35	.90 9813	59
2	7947	17.08	6720	.27	1228	17.30	8772	58
3	8970	17.05	6704	.27	2266	17.27	7734	57
4	.08 9990	17.00	6688	.25	3302	17.23	6698	56
5	**9.09 1008**	16.97	**9.99 6673**	.27	**9.09 4336**	17.18	**10.90 5664**	**55**
6	2024	16.93	6657	.27	5367	17.13	4633	54
7	3037	16.88	6641	.27	6395	17.12	3605	53
8	4047	16.83	6625	.25	7422	17.07	2578	52
9	5056	16.82	6610	.27	8446	17.03	1554	51
10	**9.09 6062**	16.77	**9.99 6594**	.27	**9.09 9468**	16.98	**10.90 0532**	**50**
11	7065	16.72	6578	.27	.10 0487	16.95	.89 9513	49
12	8066	16.68	6562	.27	1504	16.92	8496	48
13	.09 9065	16.65	6546	.27	2519	16.88	7481	47
14	.10 0062	16.62	6530	.27	3532	16.83	6468	46
15	**9.10 1056**	16.57	**9.99 6514**	.27	**9.10 4542**	16.80	**10.89 5458**	**45**
16	2048	16.53	6498	.27	5550	16.77	4450	44
17	3037	16.48	6482	.28	6556	16.72	3444	43
18	4025	16.47	6465	.27	7559	16.68	2441	42
19	5010	16.42	6449	.27	8560	16.65	1440	41
20	**9.10 5992**	16.37	**9.99 6433**	.27	**9.10 9559**	16.62	**10.89 0441**	**40**
21	6973	16.35	6417	.28	.11 0556	16.58	.88 9444	39
22	7951	16.30	6400	.27	1551	16.53	8449	38
23	8927	16.27	6384	.27	2543	16.50	7457	37
24	.10 9901	16.23	6368	.28	3533	16.47	6467	36
25	**9.11 0873**	16.20	**9.99 6351**	.27	**9.11 4521**	16.43	**10.88 5479**	**35**
26	1842	16.15	6335	.28	5507	16.40	4493	34
27	2809	16.12	6318	.27	6491	16.35	3509	33
28	3774	16.08	6302	.28	7472	16.33	2528	32
29	4737	16.05	6285	.27	8452	16.28	1548	31
30	**9.11 5698**	16.02	**9.99 6269**	.28	**9.11 9429**	16.25	**10.88 0571**	**30**
31	6656	15.97	6252	.28	.12 0404	16.22	.87 9596	29
32	7613	15.95	6235	.27	1377	16.18	8623	28
33	8567	15.90	6219	.28	2348	16.15	7652	27
34	.11 9519	15.87	6202	.28	3317	16.12	6683	26
35	**9.12 0469**	15.83	**9.99 6185**	.28	**9.12 4284**	16.08	**10.87 5716**	**25**
36	1417	15.80	6168	.28	5249	16.03	4751	24
37	2362	15.75	6151	.28	6211	16.02	3789	23
38	3306	15.73	6134	.28	7172	15.97	2828	22
39	4248	15.70	6117	.28	8130	15.95	1870	21
40	**9.12 5187**	15.65	**9.99 6100**	.28	**9.12 9087**	15.90	**10.87 0913**	**20**
41	6125	15.63	6083	.28	.13 0041	15.88	.86 9959	19
42	7060	15.58	6066	.28	0994	15.83	9006	18
43	7993	15.55	6049	.28	1944	15.82	8056	17
44	8925	15.53	6032	.28	2893	15.77	7107	16
45	**9.12 9854**	15.48	**9.99 6015**	.28	**9.13 3839**	15.75	**10.86 6161**	**15**
46	.13 0781	15.45	5998	.30	4784	15.70	5216	14
47	1706	15.42	5980	.28	5726	15.68	4274	13
48	2630	15.40	5963	.28	6667	15.63	3333	12
49	3551	15.35	5946	.30	7605	15.62	2395	11
50	**9.13 4470**	15.32	**9.99 5928**	.28	**9.13 8542**	15.57	**10.86 1458**	**10**
51	5387	15.28	5911	.28	.13 9476	15.55	.86 0524	9
52	6303	15.27	5894	.30	.14 0409	15.52	.85 9591	8
53	7216	15.22	5876	.28	1340	15.48	8660	7
54	8128	15.20	5859	.30	2269	15.45	7731	6
55	**9.13 9037**	15.15	**9.99 5841**	.30	**9.14 3196**	15.42	**10.85 6804**	**5**
56	.13 9944	15.12	5823	.28	4121	15.38	5879	4
57	.14 0850	15.10	5806	.30	5044	15.37	4956	3
58	1754	15.07	5788	.28	5966	15.32	4034	2
59	2655	15.02	5771	.30	6885	15.30	3115	1
60	**9.14 3555**	15.00	**9.99 5753**		**9.14 7803**		**10.85 2197**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

97° 82°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.14 3555**	14.97	**9.99 5753**	.30	**9.14 7803**	15.25	**10.85 2197**	60
1	4453	14.93	5735	.30	8718	15.23	1282	59
2	5349	14.90	5717	.30	.14 9632	15.20	.85 0368	58
3	6243	14.88	5699	.30	.15 0544	15.17	.84 9456	57
4	7136	14.83	5681	.28	1454	15.15	8546	56
5	**9.14 8026**	14.82	**9.99 5664**	.30	**9.15 2363**	15.10	**10.84 7637**	55
6	8915	14.78	5646	.30	3269	15.08	6731	54
7	.14 9802	14.73	5628	.30	4174	15.05	5826	53
8	.15 0686	14.72	5610	.32	5077	15.02	4923	52
9	1569	14.70	5591	.30	5978	14.98	4022	51
10	**9.15 2451**	14.65	**9.99 5573**	.30	**9.15 6877**	14.97	**10.84 3123**	50
11	3330	14.63	5555	.30	7775	14.93	2225	49
12	4208	14.58	5537	.30	8671	14.90	1329	48
13	5083	14.57	5519	.30	.15 9565	14.87	.84 0435	47
14	5957	14.55	5501	.32	.16 0457	14.83	.83 9543	46
15	**9.15 6830**	14.50	**9.99 5482**	.30	**9.16 1347**	14.82	**10.83 8653**	45
16	7700	14.48	5464	.30	2236	14.78	7764	44
17	8569	14.43	5446	.32	3123	14.75	6877	43
18	.15 9435	14.43	5427	.30	4008	14.73	5992	42
19	.16 0301	14.38	5409	.32	4892	14.70	5108	41
20	**9.16 1164**	14.35	**9.99 5390**	.30	**9.16 5774**	14.67	**10.83 4226**	40
21	2025	14.33	5372	.32	6654	14.63	3346	39
22	2885	14.30	5353	.32	7532	14.62	2468	38
23	3743	14.28	5334	.32	8409	14.58	1591	37
24	4600	14.23	5316	.30	.16 9284	14.55	.83 0716	36
25	**9.16 5454**	14.22	**9.99 5297**	.32	**9.17 0157**	14.53	**10.82 9843**	35
26	6307	14.20	5278	.30	1029	14.50	8971	34
27	7159	14.15	5260	.32	1899	14.47	8101	33
28	8008	14.13	5241	.32	2767	14.45	7233	32
29	8856	14.10	5222	.32	3634	14.42	6366	31
30	**9.16 9702**	14.08	**9.99 5203**	.32	**9.17 4499**	14.38	**10.82 5501**	30
31	.17 0547	14.03	5184	.32	5362	14.37	4638	29
32	1389	14.02	5165	.32	6224	14.33	3776	28
33	2230	14.00	5146	.32	7084	14.30	2916	27
34	3070	13.97	5127	.32	7942	14.28	2058	26
35	**9.17 3908**	13.93	**9.99 5108**	.32	**9.17 8799**	14.27	**10.82 1201**	25
36	4744	13.90	5089	.32	.17 9655	14.22	.82 0345	24
37	5578	13.88	5070	.32	.18 0508	14.20	.81 9492	23
38	6411	13.85	5051	.32	1360	14.18	8640	22
39	7242	13.83	5032	.32	2211	14.13	7789	21
40	**9.17 8072**	13.80	**9.99 5013**	.33	**9.18 3059**	14.13	**10.81 6941**	20
41	8900	13.77	4993	.32	3907	14.08	6093	19
42	.17 9726	13.75	4974	.32	4752	14.08	5248	18
43	.18 0551	13.72	4955	.32	5597	14.03	4403	17
44	1374	13.70	4935	.33	6439	14.02	3561	16
45	**9.18 2196**	13.67	**9.99 4916**	.32	**9.18 7280**	14.00	**10.81 2720**	15
46	3016	13.63	4896	.33	8120	13.97	1880	14
47	3834	13.62	4877	.32	8958	13.93	1042	13
48	4651	13.58	4857	.33	.18 9794	13.92	.81 0206	12
49	5466	13.57	4838	.32	.19 0629	13.88	.80 9371	11
50	**9.18 6280**	13.53	**9.99 4818**	.33	**9.19 1462**	13.87	**10.80 8538**	10
51	7092	13.52	4798	.33	2294	13.83	7706	9
52	7903	13.48	4779	.32	3124	13.82	6876	8
53	8712	13.45	4759	.33	3953	13.78	6047	7
54	.18 9519	13.43	4739	.33	4780	13.77	5220	6
55	**9.19 0325**	13.42	**9.99 4720**	.32	**9.19 5606**	13.73	**10.80 4394**	5
56	1130	13.38	4700	.33	6430	13.72	3570	4
57	1933	13.35	4680	.33	7253	13.68	2747	3
58	2734	13.33	4660	.33	8074	13.67	1926	2
59	3534	13.30	4640	.33	8894	13.65	1106	1
60	**9.19 4332**		**9.99 4620**	.33	**9.19 9713**		**10.80 0287**	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

9° 170°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.19 4332**		**9.99 4620**		**9.19 9713**		**10.80 0287**	**60**
1	5129	13.28	4600	.33	.20 0529	13.60	.79 9471	59
2	5925	13.27	4580	.33	1345	13.60	8655	58
3	6719	13.23	4560	.33	2159	13.57	7841	57
4	7511	13.20	4540	.33	2971	13.53	7029	56
5	**9.19 8302**	13.18	**9.99 4519**	.35	**9.20 3782**	13.52	**10.79 6218**	**55**
6	9091	13.15	4499	.33	4592	13.50	5408	54
7	.19 9879	13.13	4479	.33	5400	13.47	4600	53
8	.20 0666	13.12	4459	.33	6207	13.45	3793	52
9	1451	13.08	4438	.35	7013	13.43	2987	51
10	**9.20 2234**	13.05	**9.99 4418**	.33	**9.20 7817**	13.40	**10.79 2183**	**50**
11	3017	13.05	4398	.33	8619	13.37	1381	49
12	3797	13.00	4377	.35	.20 9420	13.35	.79 0580	48
13	4577	13.00	4357	.33	21 0220	13.33	.78 9780	47
14	5354	12.95	4336	.35	1018	13.30	8982	46
15	**9.20 6131**	12.95	**9.99 4316**	.33	**9.21 1815**	13.28	**10 78 8185**	**45**
16	6906	12.92	4295	.35	2611	13.27	7389	44
17	7679	12.88	4274	.35	3405	13.23	6595	43
18	8452	12.88	4254	.33	4198	13.22	5802	42
19	9222	12.83	4233	.35	4989	13.18	5011	41
20	**9.20 9992**	12.83	**9.99 4212**	.35	**9.21 5780**	13.18	**10.78 4220**	**40**
21	.21 0760	12.80	4191	.35	6568	13.13	3432	39
22	1526	12.77	4171	.33	7356	13.13	2644	38
23	2291	12.75	4150	.35	8142	13.10	1858	37
24	3055	12.73	4129	.35	8926	13.07	1074	36
25	**9.21 3818**	12.72	**9.99 4108**	.35	**9.21 9710**	13.07	**10.78 0290**	**35**
26	4579	12.68	4087	.35	.22 0492	13.03	.77 9508	34
27	5338	12.65	4066	.35	1272	13.00	8728	33
28	6097	12.65	4045	.35	2052	13.00	7948	32
29	6854	12.62	4024	.35	2830	12.97	7170	31
30	**9.21 7609**	12.58	**9.99 4003**	.35	**9.22 3607**	12.95	**10.77 6393**	**30**
31	8363	12.57	3982	.37	4382	12.92	5618	29
32	9116	12.55	3960	.35	5156	12.90	4844	28
33	.21 9868	12.53	3939	.35	5929	12.88	4071	27
34	.22 0618	12.50	3918	.35	6700	12.85	3300	26
35	**9.22 1367**	12.48	**9.99 3897**	.37	**9.22 7471**	12.80	**10.77 2529**	**25**
36	2115	12.47	3875	.35	8239	12.80	1761	24
37	2861	12.43	3854	.37	9007	12.77	0993	23
38	3606	12.42	3832	.37	.22 9773	12.77	.77 0227	22
39	4349	12.38	3811	.35	.23 0539	12.72	.76 9461	21
40	**9.22 5092**	12.38	**9.99 3789**	.37	**9.23 1302**	12.72	**10.76 8698**	**20**
41	5833	12.35	3768	.35	2065	12.68	7935	19
42	6573	12.33	3746	.37	2826	12.67	7174	18
43	7311	12.30	3725	.35	3586	12.65	6414	17
44	8048	12.28	3703	.37	4345	12.63	5655	16
45	**9.22 8784**	12.27	**9.99 3681**	.37	**9.23 5103**	12.60	**10.76 4897**	**15**
46	.22 9518	12.23	3660	.35	5859	12.58	4141	14
47	.23 0252	12.23	3638	.37	6614	12.57	3386	13
48	0984	12.20	3616	.37	7368	12.53	2632	12
49	1715	12.18	3594	.37	8120	12.53	1880	11
50	**9.23 2444**	12.15	**9.99 3572**	.37	**9.23 8872**	12.50	**10.76 1128**	**10**
51	3172	12.13	3550	.37	.23 9622	12.48	.76 0378	9
52	3899	12.12	3528	.37	.24 0371	12.45	.75 9629	8
53	4625	12.10	3506	.37	1118	12.45	8882	7
54	5349	12.07	3484	.37	1865	12.42	8135	6
55	**9.23 6073**	12.07	**9.99 3462**	.37	**9.24 2610**	12.40	**10.75 7390**	**5**
56	6795	12.03	3440	.37	3354	12.38	6646	4
57	7515	12.00	3418	.37	4097	12.37	5903	3
58	8235	12.00	3396	.37	4839	12.33	5161	2
59	8953	11.97	3374	.37	5579	12.33	4421	1
60	**9.23 9670**	11.95	**9.99 3351**	.38	**9.24 6319**		**10.75 3681**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

99° 80°

10° 169°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.23 9670**		**9.99 3351**		**9.24 6319**		**10.75 3681**	**60**
1	.24 0386	11.93	3329	.37	7057	12.30	2943	59
2	1101	11.92	3307	.37	7794	12.28	2206	58
3	1814	11.88	3284	.38	8530	12.27	1470	57
4	2526	11.87	3262	.37	9264	12.23	0736	56
5	**9.24 3237**	11.85	**9.99 3240**	.37	**9.24 9998**	12.23	**10.75 0002**	**55**
6	3947	11.83	3217	.38	.25 0730	12.20	.74 9270	54
7	4656	11.82	3195	.37	1461	12.18	8539	53
8	5363	11.78	3172	.38	2191	12.17	7809	52
9	6069	11.77	3149	.38	2920	12.15	7080	51
10	**9.24 6775**	11.77	**9.99 3127**	.37	**9.25 3648**	12.13	**10.74 6352**	**50**
11	7478	11.72	3104	.38	4374	12.10	5626	49
12	8181	11.72	3081	.38	5100	12.10	4900	48
13	8883	11.70	3059	.37	5824	12.07	4176	47
14	.24 9583	11.67	3036	.38	6547	12.05	3453	46
15	**9.25 0282**	11.65	**9.99 3013**	.38	**9.25 7269**	12.03	**10.74 2731**	**45**
16	0980	11.63	2990	.38	7990	12.02	2010	44
17	1677	11.62	2967	.38	8710	12.00	1290	43
18	2373	11.60	2944	.38	.25 9429	11.98	.74 0571	42
19	3067	11.57	2921	.38	.26 0146	11.95	.73 9854	41
20	**9.25 3761**	11.57	**9.99 2898**	.38	**9.26 0863**	11.95	**10.73 9137**	**40**
21	4453	11.53	2875	.38	1578	11.92	8422	39
22	5144	11.52	2852	.38	2292	11.90	7708	38
23	5834	11.50	2829	.38	3005	11.88	6995	37
24	6523	11.48	2806	.38	3717	11.87	6283	36
25	**9.25 7211**	11.47	**9.99 2783**	.38	**9.26 4428**	11.85	**10.73 5572**	**35**
26	7898	11.45	2759	.40	5138	11.83	4862	34
27	8583	11.42	2736	.38	5847	11.82	4153	33
28	9268	11.42	2713	.38	6555	11.80	3445	32
29	.25 9951	11.38	2690	.38	7261	11.77	2739	31
30	**9.26 0633**	11.37	**9.99 2666**	.40	**9.26 7967**	11.77	**10.73 2033**	**30**
31	1314	11.35	2643	.38	8671	11.73	1329	29
32	1994	11.33	2619	.40	.26 9375	11.73	.73 0625	28
33	2673	11.32	2596	.38	.27 0077	11.70	.72 9923	27
34	3351	11.30	2572	.40	0779	11.70	9221	26
35	**9.26 4027**	11.27	**9.99 2549**	.38	**9.27 1479**	11.67	**10.72 8521**	**25**
36	4703	11.27	2525	.40	2178	11.65	7822	24
37	5377	11.23	2501	.40	2876	11.63	7124	23
38	6051	11.23	2478	.38	3573	11.62	6427	22
39	6723	11.20	2454	.40	4269	11.60	5731	21
40	**9.26 7395**	11.20	**9.99 2430**	.40	**9.27 4964**	11.58	**10.72 5036**	**20**
41	8065	11.17	2406	.40	5658	11.57	4342	19
42	8734	11.15	2382	.40	6351	11.55	3649	18
43	.26 9402	11.13	2359	.38	7043	11.53	2957	17
44	.27 0069	11.12	2335	.40	7734	11.52	2266	16
45	**9.27 0735**	11.10	**9.99 2311**	.40	**9.27 8424**	11.50	**10.72 1576**	**15**
46	1400	11.08	2287	.40	9113	11.48	0887	14
47	2064	11.07	2263	.40	.27 9801	11.47	.72 0199	13
48	2726	11.03	2239	.42	.28 0488	11.45	.71 9512	12
49	3388	11.03	2214	.40	1174	11.43	8826	11
50	**9.27 4049**	11.02	**9.99 2190**	.40	**9.28 1858**	11.40	**10.71 8142**	**10**
51	4708	10.98	2166	.40	2542	11.40	7458	9
52	5367	10.98	2142	.40	3225	11.38	6775	8
53	6025	10.97	2118	.42	3907	11.37	6093	7
54	6681	10.93	2093	.40	4588	11.35	5412	6
55	**9.27 7337**	10.93	**9.99 2069**	.42	**9.28 5268**	11.33	**10.71 4732**	**5**
56	7991	10.90	2044	.40	5947	11.32	4053	4
57	8645	10.90	2020	.40	6624	11.28	3376	3
58	9297	10.87	1996	.42	7301	11.28	2699	2
59	.27 9948	10.85	1971	.40	7977	11.27	2023	1
60	**9.28 0599**	10.85	**9.99 1947**		**9.28 8652**	11.25	**10.71 1348**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

100° 79°

11° 168°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.28 0599		9.99 1947		9.28 8652		10.71 1348	60
1	1248	10.82	1922	.42	9326	11.23	0674	59
2	1897	10.82	1897	.42	.28 9999	11.22	.71 0001	58
3	2544	10.78	1873	.40	.29 0671	11.20	.70 9329	57
4	3190	10.77	1848	.42	1342	11.18	8658	56
5	9.28 3836	10.73	9.99 1823	.40	9.29 2013	11.18	10.70 7987	55
6	4480	10.73	1799	.42	2682	11.15	7318	54
7	5124	10.70	1774	.42	3350	11.13	6650	53
8	5766	10.70	1749	.42	4017	11.12	5983	52
9	6408	10.67	1724	.42	4684	11.12	5316	51
10	9.28 7048	10.67	9.99 1699	.42	9.29 5349	11.08	10.70 4651	50
11	7688	10.63	1674	.42	6013	11.07	3987	49
12	8326	10.63	1649	.42	6677	11.07	3323	48
13	8964	10.60	1624	.42	7339	11.03	2661	47
14	.28 9600	10.60	1599	.42	8001	11.03	1999	46
15	9.29 0236	10.57	9.99 1574	.42	9.29 8662	11.02	10.70 1338	45
16	0870	10.57	1549	.42	9322	11.00	0678	44
17	1504	10.55	1524	.43	.29 9980	10.97	.70 0020	43
18	2137	10.52	1498	.42	.30 0638	10.97	.69 9362	42
19	2768	10.52	1473	.42	1295	10.95	8705	41
20	9.29 3399	10.50	9.99 1448	.43	9.30 1951	10.93	10.69 8049	40
21	4029	10.48	1422	.42	2607	10.93	7393	39
22	4658	10.47	1397	.42	3261	10.90	6739	38
23	5286	10.45	1372	.42	3914	10.88	6086	37
24	5913	10.43	1346	.43	4567	10.88	5433	36
25	9.29 6539	10.42	9.99 1321	.42	9.30 5218	10.85	10.69 4782	35
26	7164	10.40	1295	.43	5869	10.83	4131	34
27	7788	10.40	1270	.42	6519	10.82	3481	33
28	8412	10.40	1244	.43	7168	10.80	2832	32
29	9034	10.37	1218	.43	7816	10.78	2184	31
30	9.29 9655	10.35	9.99 1193	.42	9.30 8463	10.77	10.69 1537	30
31	.30 0276	10.32	1167	.43	9109	10.75	0891	29
32	0895	10.32	1141	.43	.30 9754	10.75	.69 0246	28
33	1514	10.32	1115	.43	.31 0399	10.72	.68 9601	27
34	2132	10.30	1090	.42	1042	10.72	8958	26
35	9.30 2748	10.27	9.99 1064	.43	9.31 1685	10.70	10.68 8315	25
36	3364	10.25	1038	.43	2327	10.68	7673	24
37	3979	10.23	1012	.43	2968	10.67	7032	23
38	4593	10.23	0986	.43	3608	10.65	6392	22
39	5207	10.20	0960	.43	4247	10.63	5753	21
40	9.30 5819	10.18	9.99 0934	.43	9.31 4885	10.63	10.68 5115	20
41	6430	10.18	0908	.43	5523	10.60	4477	19
42	7041	10.15	0882	.45	6159	10.60	3841	18
43	7650	10.15	0855	.43	6795	10.58	3205	17
44	8259	10.13	0829	.43	7430	10.57	2570	16
45	9.30 8867	10.12	9.99 0803	.43	9.31 8064	10.55	10.68 1936	15
46	.30 9474	10.10	0777	.45	8697	10.55	1303	14
47	.31 0080	10.08	0750	.43	9330	10.52	0670	13
48	0685	10.07	0724	.45	.32 9961	10.52	.68 0039	12
49	1289	10.07	0697	.45	.32 0592	10.50	.67 9408	11
50	9.31 1893	10.03	9.99 0671	.43	9.32 1222	10.48	10.67 8778	10
51	2495	10.03	0645	.45	1851	10.47	8149	9
52	3097	10.02	0618	.45	2479	10.45	7521	8
53	3698	9.98	0591	.45	3106	10.45	6894	7
54	4297	10.00	0565	.43	3733	10.42	6267	6
55	9.31 4897	9.97	9.99 0538	.45	9.32 4358	10.42	10.67 5642	5
56	5495	9.95	0511	.43	4983	10.40	5017	4
57	6092	9.95	0485	.45	5607	10.40	4393	3
58	6689	9.92	0458	.45	6231	10.37	3769	2
59	7284	9.92	0431	.45	6853	10.37	3147	1
60	9.31 7879		9.99 0404		9.32 7475		10.67 2525	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

101 78°

12° 167°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.31 7879**	9.90	**9.99 0404**	.43	**9.32 7475**	10.33	**10.67 2525**	**60**
1	8473	9.88	0378	.45	8095	10.33	1905	59
2	9066	9.87	0351	.45	8715	10.32	1285	58
3	.31 9658	9.85	0324	.45	9334	10.32	0666	57
4	.32 0249	9.85	0297	.45	.32 9953	10.28	.67 0047	56
5	**9.32 0840**	9.83	**9.99 0270**	.45	**9.33 0570**	10.28	**10.66 9430**	**55**
6	1430	9.82	0243	.47	1187	10.27	8813	54
7	2019	9.80	0215	.45	1803	10.25	8197	53
8	2607	9.78	0188	.45	2418	10.25	7582	52
9	3194	9.77	0161	.45	3033	10.22	6967	51
10	**9.32 3780**	9.77	**9.99 0134**	.45	**9.33 3646**	10.22	**10.66 6354**	**50**
11	4366	9.73	0107	.47	4259	10.20	5741	49
12	4950	9.73	0079	.45	4871	10.18	5129	48
13	5534	9.72	0052	.45	5482	10.18	4518	47
14	6117	9.72	.99 0025	.47	6093	10.15	3907	46
15	**9.32 6700**	9.68	**9.98 9997**	.45	**9.33 6702**	10.15	**10.66 3298**	**45**
16	7281	9.68	9970	.47	7311	10.13	2689	44
17	7862	9.67	9942	.45	7919	10.13	2081	43
18	8442	9.65	9915	.47	8527	10.10	1473	42
19	9021	9.63	9887	.45	9133	10.10	0867	41
20	**9.32 9599**	9.62	**9.98 9860**	.47	**9.33 9739**	10.08	**10.66 0261**	**40**
21	.33 0176	9.62	9832	.47	.34 0344	10.07	.65 9656	39
22	0753	9.60	9804	.45	0948	10.07	9052	38
23	1329	9.57	9777	.47	1552	10.05	8448	37
24	1903	9.58	9749	.47	2155	10.03	7845	36
25	**9.33 2473**	9.55	**9.98 9721**	.47	**9.34 2757**	10.02	**10.65 7243**	**35**
26	3051	9.55	9693	.47	3358	10.00	6642	34
27	3624	9.55	9665	.47	3958	10.00	6042	33
28	4195	9.52	9637	.47	4558	9.98	5442	32
29	4767	9.53	9610	.45	5157	9.97	4843	31
30	**9.33 5337**	9.50	**9.98 9582**	.47	**9.34 5755**	9.97	**10.65 4245**	**30**
31	5906	9.48	9553	.48	6353	9.93	3647	29
32	6475	9.48	9525	.47	6949	9.93	3051	28
33	7043	9.47	9497	.47	7545	9.93	2455	27
34	7610	9.45	9469	.47	8141	9.90	1859	26
35	**9.33 8176**	9.43	**9.98 9441**	.47	**9.34 8735**	9.90	**10.65 1265**	**25**
36	8742	9.42	9413	.47	9329	9.88	0671	24
37	9307	9.40	9385	.48	.34 9922	9.87	.65 0078	23
38	.33 9871	9.38	9356	.47	.35 0514	9.87	.64 9486	22
39	.34 0434	9.37	9328	.47	1106	9.85	8894	21
40	**9.34 0996**	9.37	**9.98 9300**	.48	**9.35 1697**	9.83	**10.64 8303**	**20**
41	1558	9.35	9271	.47	2287	9.82	7713	19
42	2119	9.33	9243	.48	2876	9.82	7124	18
43	2679	9.33	9214	.47	3465	9.80	6535	17
44	3239	9.30	9186	.48	4053	9.78	5947	16
45	**9.34 3797**	9.30	**9.98 9157**	.48	**9.35 4640**	9.78	**10.64 5360**	**15**
46	4355	9.28	9128	.47	5227	9.77	4773	14
47	4912	9.28	9100	.48	5813	9.75	4187	13
48	5469	9.25	9071	.48	6398	9.73	3602	12
49	6024	9.25	9042	.48	6982	9.73	3018	11
50	**9.34 6579**	9.25	**9.98 9014**	.47	**9.35 7566**	9.72	**10.64 2434**	**10**
51	7134	9.22	8985	.48	8149	9.70	1851	9
52	7687	9.22	8956	.48	8731	9.70	1269	8
53	8240	9.20	8927	.48	9313	9.67	0687	7
54	8792	9.18	8898	.48	.35 9893	9.68	.64 0107	6
55	**9.34 9343**	9.17	**9.98 8869**	.48	**9.36 0474**	9.65	**10.63 9526**	**5**
56	.34 9893	9.17	8840	.48	1053	9.65	8947	4
57	.35 0443	9.15	8811	.48	1632	9.63	8368	3
58	0992	9.13	8782	.48	2210	9.62	7790	2
59	1540	9.13	8753	.48	2787	9.62	7213	1
60	**9.35 2088**		**9.98 8724**	.48	**9.36 3364**		**10.63 6636**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

102° 77°

13° 166°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.35 2088**	9.12	**9.98 8724**	.48	**9.36 3364**	9.60	**10.63 6636**	**60**
1	2635	9.10	8695	.48	3940	9.58	6060	59
2	3181	9.08	8666	.48	4515	9.58	5485	58
3	3726	9.08	8636	.50	5090	9.58	4910	57
4	4271	9.07	8607	.48	5664	9.57	4336	56
5	**9.35 4815**	9.05	**9.98 8578**	.50	**9.36 6237**	9.55	**10.63 3763**	**55**
6	5358	9.05	8548	.48	6810	9.53	3190	54
7	5901	9.03	8519	.50	7382	9.52	2618	53
8	6443	9.02	8489	.48	7953	9.52	2047	52
9	6984	9.00	8460	.50	8524	9.50	1476	51
10	**9.35 7524**	9.00	**9.98 8430**	.48	**9.36 9094**	9.48	**10.63 0906**	**50**
11	8064	8.98	8401	.50	.36 9663	9.48	.63 0337	49
12	8603	8.97	8371	.48	.37 0232	9.45	.62 9768	48
13	9141	8.95	8342	.50	0799	9.47	9201	47
14	.35 9678	8.95	8312	.50	1367	9.43	8633	46
15	**9.36 0215**	8.95	**9.98 8282**	.50	**9.37 1933**	9.43	**10.62 8067**	**45**
16	0752	8.92	8252	.48	2499	9.42	7501	44
17	1287	8.92	8223	.50	3064	9.42	6936	43
18	1822	8.90	8193	.50	3629	9.40	6371	42
19	2356	8.88	8163	.50	4193	9.38	5807	41
20	**9.36 2889**	8.88	**9.98 8133**	.50	**9.37 4756**	9.38	**10.62 5244**	**40**
21	3422	8.87	8103	.50	5319	9.37	4681	39
22	3954	8.85	8073	.50	5881	9.35	4119	38
23	4485	8.85	8043	.50	6442	9.35	3558	37
24	5016	8.83	8013	.50	7003	9.33	2997	36
25	**9.36 5546**	8.82	**9.98 7983**	.50	**9.37 7563**	9.32	**10.62 2437**	**35**
26	6075	8.82	7953	.52	8122	9.32	1878	34
27	6604	8.78	7922	.50	8681	9.30	1319	33
28	7131	8.80	7892	.50	9239	9.30	0761	32
29	7659	8.77	7862	.50	.37 9797	9.28	.62 0203	31
30	**9.36 8185**	8.77	**9.98 7832**	.52	**9.38 0354**	9.27	**10.61 9646**	**30**
31	8711	8.75	7801	.50	0910	9.27	9090	29
32	9236	8.75	7771	.52	1466	9.23	8534	28
33	.36 9761	8.72	7740	.50	2020	9.25	7980	27
34	.37 0285	8.72	7710	.52	2575	9.23	7425	26
35	**9.37 0808**	8.70	**9.98 7679**	.50	**9.38 3129**	9.22	**10.61 6871**	**25**
36	1330	8.70	7649	.52	3682	9.20	6318	24
37	1852	8.68	7618	.50	4234	9.20	5766	23
38	2373	8.68	7588	.52	4786	9.18	5214	22
39	2894	8.67	7557	.52	5337	9.18	4663	21
40	**9.37 3414**	8.65	**9.98 7526**	.50	**9.38 5888**	9.17	**10.61 4112**	**20**
41	3933	8.65	7496	.52	6438	9.15	3562	19
42	4452	8.63	7465	.52	6987	9.15	3013	18
43	4970	8.62	7434	.52	7536	9.13	2464	17
44	5487	8.60	7403	.52	8084	9.12	1916	16
45	**9.37 6003**	8.60	**9.98 7372**	.52	**9.38 8631**	9.12	**10.61 1369**	**15**
46	6519	8.60	7341	.52	9178	9.10	0822	14
47	7035	8.57	7310	.52	.38 9724	9.10	.61 0276	13
48	7549	8.57	7279	.52	.39 0270	9.08	.60 9730	12
49	8063	8.57	7248	.52	0815	9.08	9185	11
50	**9.37 8577**	8.53	**9.98 7217**	.52	**9.39 1360**	9.05	**10.60 8640**	**10**
51	9089	8.53	7186	.52	1903	9.07	8097	9
52	.37 9601	8.53	7155	.52	2447	9.03	7553	8
53	.38 0113	8.52	7124	.52	2989	9.03	7011	7
54	0624	8.50	7092	.53	3531	9.03	6469	6
55	**9.38 1134**	8.48	**9.98 7061**	.52	**9.39 4073**	9.02	**10.60 5927**	**5**
56	1643	8.48	7030	.53	4614	9.00	5386	4
57	2152	8.48	6998	.52	5154	9.00	4846	3
58	2661	8.45	6967	.52	5694	8.98	4306	2
59	3168	8.45	6936	.53	6233	8.97	3767	1
60	**9.38 3675**		**9.98 6904**		**9.39 6771**		**10.60 3229**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

103° 76°

14° 165°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.38 3675**	8.45	**9.98 6904**	.52	**9.39 6771**	8.97	**10.60 3229**	**60**
1	4182	8.42	6873	.53	7309	8.95	2691	59
2	4687	8.42	6841	.53	7846	8.95	2154	58
3	5192	8.42	6809	.52	8383	8.93	1617	57
4	5697	8.40	6778	.53	8919	8.93	1081	56
5	**9.38 6201**	8.38	**9.98 6746**	.53	**9.39 9455**	8.92	**10.60 0545**	**55**
6	6704	8.38	6714	.52	.39 9990	8.90	.60 0010	54
7	7207	8.37	6683	.53	.40 0524	8.90	59 9476	53
8	7709	8.35	6651	.53	1058	8.88	8942	52
9	8210	8.35	6619	.53	1591	8.88	8409	51
10	**9.38 8711**	8.33	**9.98 6587**	.53	**9.40 2124**	8.87	**10.59 7876**	**50**
11	9211	8.33	6555	.53	2656	8.85	7344	49
12	.38 9711	8.32	6523	.53	3187	8.85	6813	48
13	.39 0210	8.30	6491	.53	3718	8.85	6282	47
14	0708	8.30	6459	.53	4249	8.82	5751	46
15	**9.39 1206**	8.28	**9.98 6427**	.53	**9.40 4778**	8.83	**10.59 5222**	**45**
16	1703	8.27	6395	.53	5308	8.80	4692	44
17	2199	8.27	6363	.53	5836	8.80	4164	43
18	2695	8.27	6331	.53	6364	8.80	3636	42
19	3191	8.23	6299	.55	6892	8.78	3108	41
20	**9.39 3685**	8.23	**9.98 6266**	.53	**9.40 7419**	8.77	**10.59 2581**	**40**
21	4179	8.23	6234	.53	7945	8.77	2055	39
22	4673	8.22	6202	.55	8471	8.75	1529	38
23	5166	8.20	6169	.53	8996	8.75	1004	37
24	5658	8.20	6137	.55	.40 9521	8.73	.59 0479	36
25	**9.39 6150**	8.18	**9.98 6104**	.53	**9.41 0045**	8.73	**10.58 9955**	**35**
26	6641	8.18	6072	.55	0569	8.72	9431	34
27	7132	8.15	6039	.53	1092	8.72	8908	33
28	7621	8.17	6007	.55	1615	8.70	8385	32
29	8111	8.15	5974	.53	2137	8.68	7863	31
30	**9.39 8600**	8.13	**9.98 5942**	.55	**9.41 2658**	8.68	**10.58 7342**	**30**
31	9088	8.12	5909	.55	3179	8.67	6821	29
32	.39 9575	8.12	5876	.55	3699	8.67	6301	28
33	.40 0062	8.12	5843	.53	4219	8.65	5781	27
34	0549	8.10	5811	.55	4738	8.65	5262	26
35	**9.40 1035**	8.08	**9.98 5778**	.55	**9.41 5257**	8.63	**10.58 4743**	**25**
36	1520	8.08	5745	.55	5775	8.63	4225	24
37	2005	8.07	5712	.55	6293	8.62	3707	23
38	2489	8.05	5679	.55	6810	8.60	3190	22
39	2972	8.05	5646	.55	7326	8.60	2674	21
40	**9.40 3455**	8.05	**9.98 5613**	.55	**9.41 7842**	8.60	**10.58 2158**	**20**
41	3938	8.03	5580	.55	8358	8.58	1642	19
42	4420	8.02	5547	.55	8873	8.57	1127	18
43	4901	8.02	5514	.57	9387	8.57	0613	17
44	5382	8.00	5480	.55	.41 9901	8.57	.58 0099	16
45	**9.40 5862**	7.98	**9.98 5447**	.55	**9.42 0415**	8.55	**10.57 9585**	**15**
46	6341	7.98	5414	.55	0927	8.55	9073	14
47	6820	7.98	5381	.57	1440	8.53	8560	13
48	7299	7.97	5347	.55	1952	8.52	8048	12
49	7777	7.95	5314	.57	2463	8.52	7537	11
50	**9.40 8254**	7.95	**9.98 5280**	.55	**9.42 2974**	8.50	**10.57 7026**	**10**
51	8731	7.93	5247	.57	3484	8.48	6516	9
52	9207	7.93	5213	.55	3993	8.50	6007	8
53	.40 9682	7.92	5180	.57	4503	8.47	5497	**7**
54	.41 0157	7.92	5146	.55	5011	8.47	4989	6
55	**9.41 0632**	7.90	**9.98 5113**	.57	**9.42 5519**	8.47	**10.57 4481**	**5**
56	1106	7.88	5079	.57	6027	8.45	3973	4
57	1579	7.88	5045	.57	6534	8.45	3466	3
58	2052	7.87	5011	.55	7041	8.43	2959	2
59	2524	7.87	4978	.57	7547	8.42	2453	1
60	**9.41 2996**		**9.98 4944**		**9.42 8052**		**10.57 1948**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

104° 75°

15° 164°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.41 2996**	7.85	**9.98 4944**	.57	**9.42 8052**	8.43	**10.57 1948**	**60**
1	3467	7.85	4910	.57	8558	8.40	1442	59
2	3938	7.85	4876	.57	9062	8.40	0938	58
3	4408	7.83	4842	.57	.42 9566	8.40	.57 0434	57
4	4878	7.83	4808	.57	.43 0070	8.38	.56 9930	56
5	**9.41 5347**	7.80	**9.98 4774**	.57	**9.43 0573**	8.37	**10.56 9427**	**55**
6	5815	7.80	4740	.57	1075	8.37	8925	54
7	6283	7.80	4706	.57	1577	8.37	8423	53
8	6751	7.77	4672	.57	2079	8.35	7921	52
9	7217	7.78	4638	.58	2580	8.33	7420	51
10	**9.41 7684**	7.77	**9.98 4603**	.57	**9.43 3080**	8.33	**10.56 6920**	**50**
11	8150	7.75	4569	.57	3580	8.33	6420	49
12	8615	7.73	4535	.57	4080	8.32	5920	48
13	9079	7.75	4500	.58	4579	8.32	5421	47
14	.41 9544	7.72	4466	.57	5078	8.30	4922	46
15	**9.42 0007**	7.72	**9.98 4432**	.57	**9.43 5576**	8.28	**10.56 4424**	**45**
16	0470	7.72	4397	.58	6073	8.28	3927	44
17	0933	7.70	4363	.57	6570	8.28	3430	43
18	1395	7.70	4328	.58	7067	8.27	2933	42
19	1857	7.68	4294	.57	7563	8.27	2437	41
20	**9.42 2318**	7.67	**9.98 4259**	.58	**9.43 8059**	8.25	**10.56 1941**	**40**
21	2778	7.67	4224	.57	8554	8.23	1446	39
22	3238	7.65	4190	.58	9048	8.25	0952	38
23	3697	7.65	4155	.58	.43 9543	8.22	.56 0457	37
24	4156	7.65	4120	.58	.44 0036	8.22	.55 9964	36
25	**9.42 4615**	7.63	**9.98 4085**	.58	**9.44 0529**	8.22	**10.55 9471**	**35**
26	5073	7.62	4050	.58	1022	8.20	8978	34
27	5530	7.62	4015	.57	1514	8.20	8486	33
28	5987	7.60	3981	.58	2006	8.18	7994	32
29	6443	7.60	3946	.58	2497	8.18	7503	31
30	**9.42 6899**	7.58	**9.98 3911**	.60	**9.44 2988**	8.18	**10.55 7012**	**30**
31	7354	7.58	3875	.58	3479	8.15	6521	29
32	7809	7.57	3840	.58	3968	8.17	6032	28
33	8263	7.57	3805	.58	4458	8.15	5542	27
34	8717	7.55	3770	.58	4947	8.13	5053	26
35	**9.42 9170**	7.55	**9.98 3735**	.58	**9.44 5435**	8.13	**10.55 4565**	**25**
36	.42 9623	7.53	3700	.60	5923	8.13	4077	24
37	.43 0075	7.53	3664	.58	6411	8.12	3589	23
38	0527	7.52	3629	.58	6898	8.10	3102	22
39	0978	7.52	3594	.58	7384	8.10	2616	21
40	**9.43 1429**	7.50	**9.98 3558**	.58	**9.44 7870**	8.10	**10.55 2130**	**20**
41	1879	7.50	3523	.60	8356	8.08	1644	19
42	2329	7.48	3487	.58	8841	8.08	1159	18
43	2778	7.47	3452	.58	9326	8.07	0674	17
44	3226	7.48	3416	.60	.44 9810	8.07	.55 0190	16
45	**9.43 3675**	7.45	**9.98 3381**	.58	**9.45 0294**	8.05	**10.54 9706**	**15**
46	4122	7.45	3345	.60	0777	8.05	9223	14
47	4569	7.45	3309	.60	1260	8.05	8740	13
48	5016	7.45	3273	.60	1743	8.03	8257	12
49	5462	7.43	3238	.58	2225	8.02	7775	11
50	**9.43 5908**	7.43	**9.98 3202**	.60	**9.45 2706**	8.02	**10.54 7294**	**10**
51	6353	7.42	3166	.60	3187	8.02	6813	9
52	6798	7.42	3130	.60	3668	8.00	6332	8
53	7242	7.40	3094	.60	4148	8.00	5852	7
54	7686	7.40	3058	.60	4628	7.98	5372	6
55	**9.43 8129**	7.38	**9.98 3022**	.60	**9.45 5107**	7.98	**10.54 4893**	**5**
56	8572	7.38	2986	.60	5586	7.97	4414	4
57	9014	7.37	2950	.60	6064	7.97	3936	3
58	9456	7.37	2914	.60	6542	7.95	3458	2
59	.43 9897	7.35	2878	.60	7019	7.95	2981	1
60	**9.44 0338**	7.35	**9.98 2842**	.60	**9.45 7496**		**10.54 2504**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

105° 74°

16° 163°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.44 0338**	7.33	**9.98 2842**	.62	**9.45 7496**	7.95	**10.54 2504**	**60**
1	0778	7.33	2805	.60	7973	7.93	2027	59
2	1218	7.33	2769	.60	8449	7.93	1551	58
3	1658	7.33	2733	.60	8925	7.92	1075	57
4	2096	7.30	2696	.62	9400	7.92	0600	56
5	**9.44 2535**	7.32	**9.98 2660**	.60	**9.45 9875**	7.92	**10.54 0125**	**55**
6	2973	7.30	2624	.60	.46 0349	7.90	.53 9651	54
7	3410	7.28	2587	.62	0823	7.90	9177	53
8	3847	7.28	2551	.60	1297	7.90	8703	52
9	4284	7.28	2514	.62	1770	7.88	8230	51
10	**9.44 4720**	7.27	**9.98 2477**	.62	**9.46 2242**	7.87	**10.53 7758**	**50**
11	5155	7.25	2441	.60	2715	7.88	7285	49
12	5590	7.25	2404	.62	3186	7.85	6814	48
13	6025	7.25	2367	.62	3658	7.87	6342	47
14	6459	7.23	2331	.60	4128	7.83	5872	46
15	**9.44 6893**	7.23	**9.98 2294**	.62	**9.46 4599**	7.85	**10.53 5401**	**45**
16	7326	7.22	2257	.62	5069	7.83	4931	44
17	7759	7.22	2220	.62	5539	7.83	4461	43
18	8191	7.20	2183	.62	6008	7.82	3992	42
19	8623	7.20	2146	.62	6477	7.82	3523	41
20	**9.44 9054**	7.18	**9.98 2109**	.62	**9.46 6945**	7.80	**10.53 3055**	**40**
21	9485	7.18	2072	.62	7413	7.80	2587	39
22	.44 9915	7.17	2035	.62	7880	7.78	2120	38
23	.45 0345	7.17	1998	.62	8347	7.78	1653	37
24	0775	7.17	1961	.62	8814	7.78	1186	36
25	**9.45 1204**	7.15	**9.98 1924**	.62	**9.46 9280**	7.77	**10.53 0720**	**35**
26	1632	7.13	1886	.63	.46 9746	7.77	.53 0254	34
27	2060	7.13	1849	.62	.47 0211	7.75	.52 9789	33
28	2488	7.13	1812	.62	0676	7.75	9324	32
29	2915	7.12	1774	.63	1141	7.75	8859	31
30	**9.45 3342**	7.12	**9.98 1737**	.62	**9.47 1605**	7.73	**10.52 8395**	**30**
31	3768	7.10	1700	.63	2069	7.73	7931	29
32	4194	7.10	1662	.62	2532	7.72	7468	28
33	4619	7.08	1625	.63	2995	7.72	7005	27
34	5044	7.08	1587	.63	3457	7.70	6543	26
35	**9.45 5469**	7.08	**9.98 1549**	.62	**9.47 3919**	7.70	**10.52 6081**	**25**
36	5893	7.07	1512	.63	4381	7.68	5619	24
37	6316	7.05	1474	.63	4842	7.68	5158	23
38	6739	7.05	1436	.63	5303	7.67	4697	22
39	7162	7.05	1399	.62	5763	7.67	4237	21
40	**9.45 7584**	7.03	**9.98 1361**	.63	**9.47 6223**	7.67	**10.52 3777**	**20**
41	8006	7.02	1323	.63	6683	7.65	3317	19
42	8427	7.02	1285	.63	7142	7.65	2858	18
43	8848	7.00	1247	.63	7601	7.65	2399	17
44	9268	7.00	1209	.63	8059	7.63	1941	16
45	**9.45 9688**	7.00	**9.98 1171**	.63	**9.47 8517**	7.63	**10.52 1483**	**15**
46	.46 0108	6.98	1133	.63	8975	7.62	1025	14
47	0527	6.98	1095	.63	9432	7.62	0568	13
48	0946	6.97	1057	.63	.47 9889	7.60	.52 0111	12
49	1364	6.97	1019	.63	.48 0345	7.60	.51 9655	11
50	**9.46 1782**	6.95	**9.98 0981**	.65	**9.48 0801**	7.60	**10.51 9199**	**10**
51	2199	6.95	0942	.63	1257	7.58	8743	9
52	2616	6.93	0904	.63	1712	7.58	8288	8
53	3032	6.93	0866	.63	2167	7.57	7833	7
54	3448	6.93	0827	.65	2621	7.57	7379	6
55	**9.46 3864**	6.92	**9.98 0789**	.65	**9.48 3075**	7.57	**10.51 6925**	**5**
56	4279	6.92	0750	.63	3529	7.55	6471	4
57	4694	6.90	0712	.65	3982	7.55	6018	3
58	5108	6.90	0673	.63	4435	7.53	5565	2
59	5522	6.88	0635	.65	4887	7.53	5113	1
60	**9.46 5935**		**9.98 0596**		**9.48 5339**		**10.51 4661**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

106° 73°

17° 162°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.46 5935**	6.88	**9.98 0596**	.63	**9.48 5339**	7.53	**10.51 4661**	**60**
1	6348	6.88	0558	.65	5791	7.52	4209	59
2	6761	6.87	0519	.65	6242	7.52	3758	58
3	7173	6.87	0480	.63	6693	7.50	3307	57
4	7585	6.85	0442	.65	7143	7.50	2857	56
5	**9.46 7996**	6.85	**9.98 0403**	.65	**9.48 7593**	7.50	**10.51 2407**	**55**
6	8407	6.83	0364	.65	8043	7.48	1957	54
7	8817	6.83	0325	.65	8492	7.48	1508	53
8	9227	6.83	0286	.65	8941	7.48	1059	52
9	.46 9637	6.82	0247	.65	9390	7.47	0610	51
10	**9.47 0046**	6.82	**9.98 0208**	.65	**9.48 9838**	7.47	**10.51 0162**	**50**
11	0455	6.80	0169	.65	.49 0286	7.45	.50 9714	49
12	0863	6.80	0130	.65	0733	7.45	9267	48
13	1271	6.80	0091	.65	1180	7.45	8820	47
14	1679	6.78	0052	.67	1627	7.43	8373	46
15	**9.47 2086**	6.77	**9.98 0012**	.65	**9.49 2073**	7.43	**10.50 7927**	**45**
16	2492	6.77	.97 9973	.65	2519	7.43	7481	44
17	2898	6.77	9934	.65	2965	7.42	7035	43
18	3304	6.77	9895	.67	3410	7.40	6590	42
19	3710	6.75	9855	.65	3854	7.42	6146	41
20	**9.47 4115**	6.73	**9.97 9816**	.67	**9.49 4299**	7.40	**10.50 5701**	**40**
21	4519	6.73	9776	.65	4743	7.38	5257	39
22	4923	6.73	9737	.67	5186	7.40	4814	38
23	5327	6.72	9697	.65	5630	7.38	4370	37
24	5730	6.72	9658	.67	6073	7.37	3927	36
25	**9.47 6133**	6.72	**9.97 9618**	.65	**9.49 6515**	7.37	**10.50 3485**	**35**
26	6536	6.70	9579	.67	6957	7.37	3043	34
27	6938	6.70	9539	.67	7399	7.37	2601	33
28	7340	6.68	9499	.67	7841	7.35	2159	32
29	7741	6.68	9459	.65	8282	7.33	1718	31
30	**9.47 8142**	6.67	**9.97 9420**	.67	**9.49 8722**	7.35	**10.50 1278**	**30**
31	8542	6.67	9380	.67	9163	7.33	0837	29
32	8942	6.67	9340	.67	.49 9603	7.32	.50 0397	28
33	9342	6.65	9300	.67	.50 0042	7.32	.49 9958	27
34	.47 9741	6.65	9260	.67	0481	7.32	9519	26
35	**9.48 0140**	6.65	**9.97 9220**	.67	**9.50 0920**	7.32	**10.49 9080**	**25**
36	0539	6.63	9180	.67	1359	7.30	8641	24
37	0937	6.62	9140	.67	1797	7.30	8203	23
38	1334	6.62	9100	.68	2235	7.28	7765	22
39	1731	6.62	9059	.67	2672	7.28	7328	21
40	**9.48 2128**	6.62	**9.97 9019**	.67	**9.50 3109**	7.28	**10.49 6891**	**20**
41	2525	6.60	8979	.67	3546	7.27	6454	19
42	2921	6.58	8939	.68	3982	7.27	6018	18
43	3316	6.60	8898	.67	4418	7.27	5582	17
44	3712	6.58	8858	.68	4854	7.25	5146	16
45	**9.48 4107**	6.57	**9.97 8817**	.67	**9.50 5289**	7.25	**10.49 4711**	**15**
46	4501	6.57	8777	.67	5724	7.25	4276	14
47	4895	6.57	8737	.68	6159	7.23	3841	13
48	5289	6.55	8696	.68	6593	7.23	3407	12
49	5682	6.55	8655	.67	7027	7.23	2973	11
50	**9.48 6075**	6.53	**9.97 8615**	.68	**9.50 7460**	7.22	**10.49 2540**	**10**
51	6467	6.55	8574	.68	7893	7.22	2107	9
52	6860	6.52	8533	.67	8326	7.22	1674	8
53	7251	6.53	8493	.68	8759	7.20	1241	7
54	7643	6.52	8452	.68	9191	7.18	0809	6
55	**9.48 8034**	6.50	**9.97 8411**	.68	**9.50 9622**	7.20	**10.49 0378**	**5**
56	8424	6.50	8370	.68	.51 0054	7.18	.48 9946	4
57	8814	6.50	8329	.68	0485	7.18	9515	3
58	9204	6.48	8288	.68	0916	7.17	9084	2
59	9593	6.48	8247	.68	1346	7.17	8654	1
60	**9.48 9982**		**9.97 8206**		**9.51 1776**		**10.48 8224**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

107° 72°

18° 161°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.48 9982	6.48	9.97 8206	.68	9.51 1776	7.17	10.48 8224	60
1	.49 0371	6.47	8165	.68	2206	7.15	7794	59
2	0759	6.47	8124	.68	2635	7.15	7365	58
3	1147	6.47	8083	.68	3064	7.15	6936	57
4	1535	6.45	8042	.68	3493	7.13	6507	56
5	9.49 1922	6.43	9.97 8001	.70	9.51 3921	7.13	10.48 6079	55
6	2308	6.45	7959	.68	4349	7.13	5651	54
7	2695	6.43	7918	.68	4777	7.12	5223	53
8	3081	6.42	7877	.70	5204	7.12	4796	52
9	3466	6.42	7835	.68	5631	7.10	4369	51
10	9.49 3851	6.42	9.97 7794	.70	9.51 6057	7.12	10.48 3934	50
11	4236	6.42	7752	.68	6484	7.10	3516	49
12	4621	6.40	7711	.70	6910	7.08	3090	48
13	5005	6.38	7669	.68	7335	7.10	2665	47
14	5388	6.40	7628	.70	7761	7.08	2239	46
15	9.49 5772	6.37	9.97 7586	.70	9.51 8186	7.07	10.48 1814	45
16	6154	6.38	7544	.68	8610	7.07	1390	44
17	6537	6.37	7503	.70	9034	7.07	0966	43
18	6919	6.37	7461	.70	9458	7.07	0542	42
19	7301	6.35	7419	.70	.51 9882	7.05	.48 0118	41
20	9.49 7682	6.35	9.97 7377	.70	9.52 0305	7.05	10.47 9695	40
21	8064	6.33	7335	.70	0728	7.05	9272	39
22	8444	6.35	7293	.70	1151	7.03	8849	38
23	8825	6.32	7251	.70	1573	7.03	8427	37
24	9204	6.33	7209	.70	1995	7.03	8005	36
25	9.49 9584	6.32	9.97 7167	.70	9.52 2417	7.02	10.47 7583	35
26	.49 9963	6.32	7125	.70	2838	7.02	7162	34
27	.50 0342	6.32	7083	.70	3259	7.02	6741	33
28	0721	6.30	7041	.70	3680	7.00	6320	32
29	1099	6.28	6999	.70	4100	7.00	5900	31
30	9.50 1476	6.30	9.97 6957	.72	9.52 4520	7.00	10.47 5480	30
31	1854	6.28	6914	.70	4940	6.98	5060	29
32	2231	6.27	6872	.70	5359	6.98	4641	28
33	2607	6.28	6830	.72	5778	6.98	4222	27
34	2984	6.27	6787	.70	6197	6.97	3803	26
35	9.50 3360	6.25	9.97 6745	.72	9.52 6615	6.97	10.47 3385	25
36	3735	6.25	6702	.70	7033	6.97	2967	24
37	4110	6.25	6660	.72	7451	6.95	2549	23
38	4485	6.25	6617	.72	7868	6.95	2132	22
39	4860	6.23	6574	.70	8285	6.95	1715	21
40	9.50 5234	6.23	9.97 6532	.72	9.52 8702	6.95	10.47 1298	20
41	5608	6.22	6489	.72	9119	6.93	0881	19
42	5981	6.22	6446	.70	9535	6.93	0465	18
43	6354	6.22	6404	.72	.52 9951	6.92	.47 0049	17
44	6727	6.20	6361	.72	.53 0366	6.92	.46 9634	16
45	9.50 7099	6.20	9.97 6318	.72	9.53 0781	6.92	10.46 9219	15
46	7471	6.20	6275	.72	1196	6.92	8804	14
47	7843	6.18	6232	.72	1611	6.90	8389	13
48	8214	6.18	6189	.72	2025	6.90	7975	12
49	8585	6.18	6146	.72	2439	6.90	7561	11
50	9.50 8956	6.17	9.97 6103	.72	9.53 2853	6.88	10.46 7147	10
51	9326	6.17	6060	.72	3266	6.88	6734	9
52	.50 9696	6.15	6017	.72	3679	6.88	6321	8
53	51 0065	6.15	5974	.73	4092	6.87	5908	7
54	0434	6.15	5930	.72	4504	6.87	5496	6
55	9.51 0803	6.15	9.97 5887	.72	9.53 4916	6.87	10.46 5084	5
56	1172	6.13	5844	.73	5328	6.85	4672	4
57	1540	6.12	5800	.72	5739	6.85	4261	3
58	1907	6.13	5757	.72	6150	6.85	3850	2
59	2275	6.12	5714	.73	6561	6.85	3439	1
60	9.51 2642		9.97 5670		9.53 6972		10.46 3028	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

108° 71°

19° 160°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.51 2642**	6.12	**9.97 5670**	.72	**9.53 6972**	6.83	**10.46 3028**	**60**
1	3009	6.10	5627	.73	7382	6.83	2618	59
2	3375	6.10	5583	.73	7792	6.83	2208	58
3	3741	6.10	5539	.72	8202	6.82	1798	57
4	4107	6.08	5496	.73	8611	6.82	1389	56
5	**9.51 4472**	6.08	**9.97 5452**	.73	**9.53 9020**	6.82	**10.46 0980**	**55**
6	4837	6.08	5408	.72	9429	6.80	0571	54
7	5202	6.07	5365	.73	.53 9837	6.80	.46 0163	53
8	5566	6.07	5321	.73	.54 0245	6.80	.45 9755	52
9	5930	6.07	5277	.73	0653	6.80	9347	51
10	**9.51 6294**	6.05	**9.97 5233**	.73	**9.54 1061**	6.78	**10.45 8939**	**50**
11	6657	6.05	5189	.73	1468	6.78	8532	49
12	7020	6.03	5145	.73	1875	6.77	8125	48
13	7382	6.05	5101	.73	2281	6.78	7719	47
14	7745	6.03	5057	.73	2688	6.77	7312	46
15	**9.51 8107**	6.02	**9.97 5013**	.73	**9.54 3094**	6.75	**10.45 6906**	**45**
16	8468	6.02	4969	.73	3499	6.77	6501	44
17	8829	6.02	4925	.75	3905	6.75	6095	43
18	9190	6.02	4880	.73	4310	6.75	5690	42
19	9551	6.00	4836	.73	4715	6.73	5285	41
20	**9.51 9911**	6.00	**9.97 4792**	.73	**9.54 5119**	6.75	**10.45 4881**	**40**
21	.52 0271	6.00	4748	.75	5524	6.73	4476	39
22	0631	5.98	4703	.73	5928	6.72	4072	38
23	0990	5.98	4659	.75	6331	6.73	3669	37
24	1349	5.97	4614	.73	6735	6.72	3265	36
25	**9.52 1707**	5.98	**9.97 4570**	.75	**9.54 7138**	6.70	**10.45 2862**	**35**
26	2066	5.97	4525	.73	7540	6.72	2460	34
27	2424	5.95	4481	.75	7943	6.70	2057	33
28	2781	5.95	4436	.75	8345	6.70	1655	32
29	3138	5.95	4391	.73	8747	6.70	1253	31
30	**9.52 3495**	5.95	**9.97 4347**	.75	**9.54 9149**	6.68	**10.45 0851**	**30**
31	3852	5.93	4302	.75	9550	6.68	0450	29
32	4208	5.93	4257	.75	.54 9951	6.68	.45 0049	28
33	4564	5.93	4212	.75	.55 0352	6.67	.44 9648	27
34	4920	5.92	4167	.75	0752	6.68	9248	26
35	**9.52 5275**	5.92	**9.97 4122**	.75	**9.55 1153**	6.65	**10.44 8847**	**25**
36	5630	5.90	4077	.75	1552	6.67	8448	24
37	5984	5.92	4032	.75	1952	6.65	8048	23
38	6339	5.90	3987	.75	2351	6.65	7649	22
39	6693	5.88	3942	.75	2750	6.65	7250	21
40	**9.52 7046**	5.90	**9.97 3897**	.75	**9.55 3149**	6.65	**10.44 6851**	**20**
41	7400	5.88	3852	.75	3548	6.63	6452	19
42	7753	5.87	3807	.77	3946	6.63	6054	18
43	8105	5.88	3761	.75	4344	6.62	5656	17
44	8458	5.87	3716	.75	4741	6.63	5259	16
45	**9.52 8810**	5.85	**9.97 3671**	.77	**9.55 5139**	6.62	**10.44 4861**	**15**
46	9161	5.87	3625	.75	5536	6.62	4464	14
47	9513	5.85	3580	.75	5933	6.60	4067	13
48	.52 9864	5.85	3535	.77	6329	6.60	3671	12
49	.53 0215	5.83	3489	.75	6725	6.60	3275	11
50	**9.53 0565**	5.83	**9.97 3444**	.77	**9.55 7121**	6.60	**10.44 2879**	**10**
51	0915	5.83	3398	.77	7517	6.60	2483	9
52	1265	5.82	3352	.75	7913	6.58	2087	8
53	1614	5.82	3307	.77	8308	6.58	1692	7
54	1963	5.82	3261	.77	8703	6.57	1297	6
55	**9.53 2312**	5.82	**9.97 3215**	.77	**9.55 9097**	6.57	**10.44 0903**	**5**
56	2661	5.80	3169	.75	9491	6.57	0509	4
57	3009	5.80	3124	.77	.55 9885	6.57	.44 0115	3
58	3357	5.78	3078	.77	.56 0279	6.57	.43 9721	2
59	3704	5.80	3032	.77	0673	6.55	9327	1
60	**9.53 4052**		**9.97 2986**		**9.56 1066**		**10.43 8934**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

109° 70°

20° 159'

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.53 4052**	5.78	**9.97 2986**	.77	**9.56 1066**	6.55	**10.43 8934**	60
1	4399	5.77	2940	.77	1459	6.53	8541	59
2	4745	5.78	2894	.77	1851	6.55	8149	58
3	5092	5.77	2848	.77	2244	6.53	7756	57
4	5438	5.75	2802	.78	2636	6.53	7364	56
5	**9.53 5783**	5.77	**9.97 2755**	.77	**9.56 3028**	6.52	**10.43 6972**	55
6	6129	5.75	2709	.77	3419	6.53	6581	54
7	6474	5.73	2663	.77	3811	6.52	6189	53
8	6818	5.75	2617	.78	4202	6.52	5798	52
9	7163	5.73	2570	.77	4593	6.50	5407	51
10	**9.53 7507**	5.73	**9.97 2524**	.77	**9.56 4983**	6.50	**10.43 5017**	50
11	7851	5.72	2478	.78	5373	6.50	4627	49
12	8194	5.73	2431	.77	5763	6.50	4237	48
13	8538	5.70	2385	.78	6153	6.48	3847	47
14	8880	5.72	2338	.78	6542	6.50	3458	46
15	**9.53 9223**	5.70	**9.97 2291**	.77	**9.56 6932**	6.47	**10.43 3068**	45
16	9565	5.70	2245	.78	7320	6.48	2680	44
17	.53 9907	5.68	2198	.78	7709	6.48	2291	43
18	.54 0249	5.68	2151	.77	8098	6.47	1902	42
19	0590	5.68	2105	.78	8486	6.45	1514	41
20	**9.54 0931**	5.68	**9.97 2058**	.78	**9.56 8873**	6.47	**10.43 1127**	40
21	1272	5.68	2011	.78	9261	6.45	0739	39
22	1613	5.67	1964	.78	.56 9648	6.45	.43 0352	38
23	1953	5.67	1917	.78	.57 0035	6.45	.42 9965	37
24	2293	5.65	1870	.78	0422	6.45	9578	36
25	**9.54 2632**	5.65	**9.97 1823**	.78	**9.57 0809**	6.43	**10.42 9191**	35
26	2971	5.65	1776	.78	1195	6.43	8805	34
27	3310	5.65	1729	.78	1581	6.43	8419	33
28	3649	5.63	1682	.78	1967	6.42	8033	32
29	3987	5.63	1635	.78	2352	6.43	7648	31
30	**9.54 4325**	5.63	**9.97 1588**	.80	**9.57 2738**	6.42	**10.42 7262**	30
31	4663	5.62	1540	.78	3123	6.40	6877	29
32	5000	5.63	1493	.78	3507	6.42	6493	28
33	5338	5.60	1446	.80	3892	6.40	6108	27
34	5674	5.62	1398	.78	4276	6.40	5724	26
35	**9.54 6011**	5.60	**9.97 1351**	.80	**9.57 4660**	6.40	**10.42 5340**	25
36	6347	5.60	1303	.78	5044	6.38	4956	24
37	6683	5.60	1256	.80	5427	6.38	4573	23
38	7019	5.58	1208	.78	5810	6.38	4190	22
39	7354	5.58	1161	.80	6193	6.38	3807	21
40	**9.54 7689**	5.58	**9.97 1113**	.78	**9.57 6576**	6.38	**10.42 3424**	20
41	8024	5.58	1066	.80	6959	6.37	3041	19
42	8359	5.57	1018	.80	7341	6.37	2659	18
43	8693	5.57	0970	.80	7723	6.35	2277	17
44	9027	5.55	0922	.80	8104	6.37	1896	16
45	**9.54 9360**	5.55	**9.97 0874**	.78	**9.57 8486**	6.35	**10.42 1514**	15
46	.54 9693	5.55	0827	.80	8867	6.35	1133	14
47	.55 0026	5.55	0779	.80	9248	6.35	0752	13
48	0359	5.55	0731	.80	.57 9629	6.33	.42 0371	12
49	0692	5.53	0683	.80	.58 0009	6.33	.41 9991	11
50	**9.55 1024**	5.53	**9.97 0635**	.82	**9.58 0389**	6.33	**10.41 9611**	10
51	1356	5.52	0586	.80	0769	6.33	9231	9
52	1687	5.52	0538	.80	1149	6.32	8851	8
53	2018	5.52	0490	.80	1528	6.32	8472	7
54	2349	5.52	0442	.80	1907	6.32	8093	6
55	**9.55 2680**	5.50	**9.97 0394**	.82	**9.58 2286**	6.32	**10.41 7714**	5
56	3010	5.52	0345	.80	2665	6.32	7335	4
57	3341	5.48	0297	.80	3044	6.30	6956	3
58	3670	5.50	0249	.82	3422	6.30	6578	2
59	4000	5.48	0200	.80	3800	6.28	6200	1
60	**9.55 4329**		**9.97 0152**		**9.58 4177**		**10.41 5823**	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

110° 69°

21° 158°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.55 4329**	5.48	**9.97 0152**	.82	**9.58 4177**	6.30	**10.41 5823**	**60**
1	4658	5.48	0103	.80	4555	6.28	5445	59
2	4987	5.47	0055	.82	4932	6.28	5068	58
3	5315	5.47	.97 0006	.82	5309	6.28	4691	57
4	5643	5.47	.96 9957	.80	5686	6.27	4314	56
5	**9.55 5971**	5.47	**9.96 9909**	.82	**9.58 6062**	6.28	**10.41 3938**	**55**
6	6299	5.45	9860	.82	6439	6.27	3561	54
7	6626	5.45	9811	.82	6815	6.25	3185	53
8	6953	5.45	9762	.80	7190	6.27	2810	52
9	7280	5.43	9714	.82	7566	6.25	2434	51
10	**9.55 7606**	5.43	**9.96 9665**	.82	**9.58 7941**	6.25	**10.41 2059**	**50**
11	7932	5.43	9616	.82	8316	6.25	1684	49
12	8258	5.42	9567	.82	8691	6.25	1309	48
13	8583	5.43	9518	.82	9066	6.23	0934	47
14	8909	5.42	9469	.82	9440	6.23	0560	46
15	**9.55 9234**	5.40	**9.96 9420**	.83	**9.58 9814**	6.23	**10.41 0186**	**45**
16	9558	5.42	9370	.82	.59 0188	6.23	.40 9812	44
17	.55 9883	5.40	9321	.82	0562	6.22	9438	43
18	.56 0207	5.40	9272	.82	0935	6.22	9065	42
19	0531	5.40	9223	.83	1308	6.22	8692	41
20	**9.56 0855**	5.38	**9.96 9173**	.82	**9.59 1681**	6.22	**10.40 8319**	**40**
21	1178	5.38	9124	.82	2054	6.20	7946	39
22	1501	5.38	9075	.83	2426	6.22	7574	38
23	1824	5.37	9025	.82	2799	6.20	7201	37
24	2146	5.37	8976	.83	3171	6.18	6829	36
25	**9.56 2468**	5.37	**9.96 8926**	.82	**9.59 3542**	6.20	**10.40 6458**	**35**
26	2790	5.37	8877	.83	3914	6.18	6086	34
27	3112	5.35	8827	.83	4285	6.18	5715	33
28	3433	5.37	8777	.82	4656	6.18	5344	32
29	3755	5.33	8728	.83	5027	6.18	4973	31
30	**9.56 4075**	5.35	**9.96 8678**	.83	**9.59 5398**	6.17	**10.40 4602**	**30**
31	4396	5.33	8628	.83	5768	6.17	4232	29
32	4716	5.33	8578	.83	6138	6.17	3862	28
33	5036	5.33	8528	.82	6508	6.17	3492	27
34	5356	5.33	8479	.83	6878	6.15	3122	26
35	**9.56 5676**	5.32	**9.96 8429**	.83	**9.59 7247**	6.15	**10.40 2753**	**25**
36	5995	5.32	8379	.83	7616	6.15	2384	24
37	6314	5.30	8329	.85	7985	6.15	2015	23
38	6632	5.32	8278	.83	8354	6.13	1646	22
39	6951	5.30	8228	.83	8722	6.15	1278	21
40	**9.56 7269**	5.30	**9.96 8178**	.83	**9.59 9091**	6.13	**10.40 0909**	**20**
41	7587	5.28	8128	.83	9459	6.13	0541	19
42	7904	5.30	8078	.85	.59 9827	6.12	.40 0173	18
43	8222	5.28	8027	.83	.60 0194	6.13	.39 9806	17
44	8539	5.28	7977	.83	0562	6.12	9438	16
45	**9.56 8856**	5.27	**9.96 7927**	.85	**9.60 0929**	6.12	**10.39 9071**	**15**
46	9172	5.27	7876	.83	1296	6.12	8704	14
47	9488	5.27	7826	.85	1663	6.10	8337	13
48	.56 9804	5.27	7775	.83	2029	6.10	7971	12
49	.57 0120	5.25	7725	.85	2395	6.10	7605	11
50	**9.57 0435**	5.27	**9.96 7674**	.83	**9.60 2761**	6.10	**10.39 7239**	**10**
51	0751	5.25	7624	.85	3127	6.10	6873	9
52	1066	5.23	7573	.85	3493	6.08	6507	8
53	1380	5.25	7522	.85	3858	6.08	6142	7
54	1695	5.23	7471	.83	4223	6.08	5777	6
55	**9.57 2009**	5.23	**9.96 7421**	.85	**9.60 4588**	6.08	**10.39 5412**	**5**
56	2323	5.22	7370	.85	4953	6.07	5047	4
57	2636	5.23	7319	.85	5317	6.08	4683	3
58	2950	5.22	7268	.85	5682	6.07	4318	2
59	3263	5.20	7217	.85	6046	6.07	3954	1
60	**9.57 3575**		**9.96 7166**		**9.60 6410**		**10.39 3590**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

111° 68°

22° 157°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.57 3575**	5.22	**9.96 7166**	.85	**9.60 6410**	6.05	**10.39 3590**	**60**
1	3888	5.20	7115	.85	6773	6.07	3227	59
2	4200	5.20	7064	.85	7137	6.05	2863	58
3	4512	5.20	7013	.87	7500	6.05	2500	57
4	4824	5.20	6961	.85	7863	6.03	2137	56
5	**9.57 5136**	5.18	**9.96 6910**	.85	**9.60 8225**	6.05	**10.39 1775**	**55**
6	5447	5.18	6859	.85	8588	6.03	1412	54
7	5758	5.18	6808	.87	8950	6.03	1050	53
8	6069	5.17	6756	.85	9312	6.03	0688	52
9	6379	5.17	6705	.87	.60 9674	6.03	.39 0326	51
10	**9.57 6689**	5.17	**9.96 6653**	.85	**9.61 0036**	6.02	**10.38 9964**	**50**
11	6999	5.17	6602	.87	0397	6.03	9603	49
12	7309	5.15	6550	.85	0759	6.02	9241	48
13	7618	5.15	6499	.87	1120	6.00	8880	47
14	7927	5.15	6447	.87	1480	6.02	8520	46
15	**9.57 8236**	5.15	**9.96 6395**	.85	**9.61 1841**	6.00	**10.38 8159**	**45**
16	8545	5.13	6344	.87	2201	6.00	7799	44
17	8853	5.15	6292	.87	2561	6.00	7439	43
18	9162	5.13	6240	.87	2921	6.00	7079	42
19	9470	5.12	6188	.87	3281	6.00	6719	41
20	**9.57 9777**	5.13	**9.96 6136**	.85	**9.61 3641**	5.98	**10.38 6359**	**40**
21	.58 0085	5.12	6085	.87	4000	5.98	6000	39
22	0392	5.12	6033	.87	4359	5.98	5641	38
23	0699	5.10	5981	.87	4718	5.98	5282	37
24	1005	5.12	5929	.88	5077	5.97	4923	36
25	**9.58 1312**	5.10	**9.96 5876**	.87	**9.61 5435**	5.97	**10.38 4565**	**35**
26	1618	5.10	5824	.87	5793	5.97	4207	34
27	1924	5.08	5772	.87	6151	5.97	3849	33
28	2229	5.10	5720	.87	6509	5.97	3491	32
29	2535	5.08	5668	.88	6867	5.95	3133	31
30	**9.58 2840**	5.08	**9.96 5615**	.87	**9.61 7224**	5.97	**10.38 2776**	**30**
31	3145	5.07	5563	.87	7582	5.95	2418	29
32	3449	5.08	5511	.88	7939	5.93	2061	28
33	3754	5.07	5458	.87	8295	5.95	1705	27
34	4058	5.05	5406	.88	8652	5.93	1348	26
35	**9.58 4361**	5.07	**9.96 5353**	.87	**9.61 9008**	5.93	**10.38 0992**	**25**
36	4665	5.05	5301	.88	9364	5.93	0636	24
37	4968	5.07	5248	.88	.61 9720	5.93	.38 0280	23
38	5272	5.03	5195	.87	.62 0076	5.93	.37 9924	22
39	5574	5.05	5143	.88	0432	5.92	9568	21
40	**9.58 5877**	5.03	**9.96 5090**	.88	**9.62 0787**	5.92	**10.37 9213**	**20**
41	6179	5.05	5037	.88	1142	5.92	8858	19
42	6482	5.02	4984	.88	1497	5.92	8503	18
43	6783	5.03	4931	.87	1852	5.92	8148	17
44	7085	5.02	4879	.88	2207	5.90	7793	16
45	**9.58 7386**	5.03	**9.96 4826**	.88	**9.62 2561**	5.90	**10.37 7439**	**15**
46	7688	5.02	4773	.88	2915	5.90	7085	14
47	7989	5.00	4720	.90	3269	5.90	6731	13
48	8289	5.02	4666	.88	3623	5.88	6377	12
49	8590	5.00	4613	.88	3976	5.90	6024	11
50	**9.58 8890**	5.00	**9.96 4560**	.88	**9.62 4330**	5.88	**10.37 5670**	**10**
51	9190	4.98	4507	.88	4683	5.88	5317	9
52	9489	5.00	4454	.90	5036	5.87	4964	8
53	.58 9789	4.98	4400	.88	5388	5.88	4612	7
54	.59 0088	4.98	4347	.88	5741	5.87	4259	6
55	**9.59 0387**	4.98	**9.96 4294**	.90	**9 62 6093**	5.87	**10.37 3907**	**5**
56	0686	4.97	4240	.88	6445	5.87	3555	4
57	0984	4.97	4187	.90	6797	5.87	3203	3
58	1282	4.97	4133	.88	7149	5.87	2851	2
59	1580	4.97	4080	.90	7501	5.85	2499	1
60	**9.59 1878**		**9.96 4026**		**9.62 7852**		**10.37 2148**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

112° 67°

23° 156°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.59 1878**	4.97	**9.96 4026**	.90	**9.62 7852**	5.85	**10.37 2148**	60
1	2176	4.95	3972	.88	8203	5.85	1797	59
2	2473	4.95	3919	.90	8554	5.85	1446	58
3	2770	4.95	3865	.90	8905	5.83	1095	57
4	3067	4.93	3811	.90	9255	5.85	0745	56
5	**9.59 3363**	4.93	**9.96 3757**	.88	**9.62 9606**	5.83	**10.37 0394**	55
6	3659	4.93	3704	.90	.62 9956	5.83	.37 0044	54
7	3955	4.93	3650	.90	.63 0306	5.83	.36 9694	53
8	4251	4.93	3596	.90	0656	5.82	9344	52
9	4547	4.92	3542	.90	1005	5.83	8995	51
10	**9.59 4842**	4.92	**9.96 3488**	.90	**9.63 1355**	5.82	**10.36 8645**	50
11	5137	4.92	3434	.92	1704	5.82	8296	49
12	5432	4.92	3379	.90	2053	5.82	7947	48
13	5727	4.90	3325	.90	2402	5.80	7598	47
14	6021	4.90	3271	.90	2750	5.82	7250	46
15	**9.59 6315**	4.90	**9.96 3217**	.90	**9.63 3099**	5.80	**10.36 6901**	45
16	6609	4.90	3163	.92	3447	5.80	6553	44
17	6903	4.88	3108	.90	3795	5.80	6205	43
18	7196	4.90	3054	.92	4143	5.78	5857	42
19	7490	4.88	2999	.90	4490	5.80	5510	41
20	**9.59 7783**	4.87	**9.96 2945**	.92	**9.63 4838**	5.78	**10.36 5162**	40
21	8075	4.88	2890	.90	5185	5.78	4815	39
22	8368	4.87	2836	.92	5532	5.78	4468	38
23	8660	4.87	2781	.90	5879	5.78	4121	37
24	8952	4.87	2727	.92	6226	5.77	3774	36
25	**9.59 9244**	4.87	**9.96 2672**	.92	**9.63 6572**	5.78	**10.36 3428**	35
26	9536	4.85	2617	.92	6919	5.77	3081	34
27	.59 9827	4.85	2562	.90	7265	5.77	2735	33
28	.60 0118	4.85	2508	.92	7611	5.75	2389	32
29	0409	4.85	2453	.92	7956	5.77	2044	31
30	**9.60 0700**	4.83	**9.96 2398**	.92	**9.63 8302**	5.75	**10.36 1698**	30
31	0990	4.83	2343	.92	8647	5.75	1353	29
32	1280	4.83	2288	.92	8992	5.75	1008	28
33	1570	4.83	2233	.92	9337	5.75	0663	27
34	1860	4.83	2178	.92	.63 9682	5.75	.36 0318	26
35	**9.60 2150**	4.82	**9.96 2123**	.93	**9.64 0027**	5.73	**10.35 9973**	25
36	2439	4.82	2067	.92	0371	5.75	9629	24
37	2728	4.82	2012	.92	0716	5.73	9284	23
38	3017	4.80	1957	.92	1060	5.73	8940	22
39	3305	4.82	1902	.93	1404	5.72	8596	21
40	**9.60 3594**	4.80	**9.96 1846**	.92	**9.64 1747**	5.73	**10.35 8253**	20
41	3882	4.80	1791	.93	2091	5.72	7909	19
42	4170	4.78	1735	.92	2434	5.72	7566	18
43	4457	4.80	1680	.93	2777	5.72	7223	17
44	4745	4.78	1624	.92	3120	5.72	6880	16
45	**9.60 5032**	4.78	**9.96 1569**	.93	**9.64 3463**	5.72	**10.35 6537**	15
46	5319	4.78	1513	.92	3806	5.70	6194	14
47	5606	4.77	1458	.93	4148	5.70	5852	13
48	5892	4.78	1402	.93	4490	5.70	5510	12
49	6179	4.77	1346	.93	4832	5.70	5168	11
50	**9.60 6465**	4.77	**9.96 1290**	.92	**9.64 5174**	5.70	**10.35 4826**	10
51	6751	4.75	1235	.93	5516	5.68	4484	9
52	7036	4.77	1179	.93	5857	5.70	4143	8
53	7322	4.75	1123	.93	6199	5.68	3801	7
54	7607	4.75	1067	.93	6540	5.68	3460	6
55	**9.60 7892**	4.75	**9.96 1011**	.93	**9.64 6881**	5.68	**10.35 3119**	5
56	8177	4.73	0955	.93	7222	5.67	2778	4
57	8461	4.73	0899	.93	7562	5.68	2438	3
58	8745	4.73	0843	.95	7903	5.67	2097	2
59	9029	4.73	0786	.93	8243	5.67	1757	1
60	**9.60 9313**		**9.96 0730**		**9.64 8583**		**10.35 1417**	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

113° B

24° 155°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.60 9313**	4.73	**9.96 0730**	.93	**9.64 8583**	5.67	**10.35 1417**	**60**
1	9597	4.72	0674	.93	8923	5.67	1077	59
2	.60 9880	4.73	0618	.95	9263	5.65	0737	58
3	.61 0164	4.72	0561	.93	9602	5.67	0398	57
4	0447	4.70	0505	.95	.64 9942	5.65	.35 0058	56
5	**9.61 0729**	4.72	**9.96 0448**	.93	**9.65 0281**	5.65	**10.34 9719**	**55**
6	1012	4.70	0392	.95	0620	5.65	9380	54
7	1294	4.70	0335	.93	0959	5.63	9041	53
8	1576	4.70	0279	.95	1297	5.65	8703	52
9	1858	4.70	0222	.95	1636	5.63	8364	51
10	**9.61 2140**	4.68	**9.96 0165**	.93	**9.65 1974**	5.63	**10.34 8026**	**50**
11	2421	4.68	0109	.95	2312	5.63	7688	49
12	2702	4.68	.96 0052	.95	2650	5.63	7350	48
13	2983	4.68	.95 9995	.95	2988	5.63	7012	47
14	3264	4.68	9938	.93	3326	5.62	6674	46
15	**9.61 3545**	4.67	**9.95 9882**	.95	**9.65 3663**	5.62	**10.34 6337**	**45**
16	3825	4.67	9825	.95	4000	5.62	6000	44
17	4105	4.67	9768	.95	4337	5.62	5663	43
18	4385	4.67	9711	.95	4674	5.62	5326	42
19	4665	4.65	9654	.97	5011	5.62	4989	41
20	**9.61 4944**	4.65	**9.95 9596**	.95	**9.65 5348**	5.60	**10.34 4652**	**40**
21	5223	4.65	9539	.95	5684	5.60	4316	39
22	5502	4.65	9482	.95	6020	5.60	3980	38
23	5781	4.65	9425	.95	6356	5.60	3644	37
24	6060	4.63	9368	.97	6692	5.60	3308	36
25	**9.61 6338**	4.63	**9.95 9310**	.95	**9.65 7028**	5.60	**10.34 2972**	**35**
26	6616	4.63	9253	.97	7364	5.58	2636	34
27	6894	4.63	9195	.95	7699	5.58	2301	33
28	7172	4.63	9138	.97	8034	5.58	1966	32
29	7450	4.62	9080	.95	8369	5.58	1631	31
30	**9.61 7727**	4.62	**9.95 9023**	.97	**9.65 8704**	5.58	**10.34 1296**	**30**
31	8004	4.62	8965	.95	9039	5.57	0961	29
32	8281	4.62	8908	.97	9373	5.58	0627	28
33	8558	4.60	8850	.97	.65 9708	5.57	.34 0292	27
34	8834	4.60	8792	.97	.66 0042	5.57	.33 9958	26
35	**9.61 9110**	4.60	**9.95 8734**	.95	**9.66 0376**	5.57	**10.33 9624**	**25**
36	9386	4.60	8677	.97	0710	5.55	9290	24
37	9662	4.60	8619	.97	1043	5.57	8957	23
38	.61 9938	4.58	8561	.97	1377	5.55	8623	22
39	.62 0213	4.58	8503	.97	1710	5.55	8290	21
40	**9.62 0488**	4.58	**9.95 8445**	.97	**9.66 2043**	5.55	**10.33 7957**	**20**
41	0763	4.58	8387	.97	2376	5.55	7624	19
42	1038	4.58	8329	.97	2709	5.55	7291	18
43	1313	4.57	8271	.97	3042	5.55	6958	17
44	1587	4.57	8213	.98	3375	5.53	6625	16
45	**9.62 1861**	4.57	**9.95 8154**	.97	**9.66 3707**	5.53	**10.33 6293**	**15**
46	2135	4.57	8096	.97	4039	5.53	5961	14
47	2409	4.55	8038	.98	4371	5.53	5629	13
48	2682	4.57	7979	.97	4703	5.53	5297	12
49	2956	4.55	7921	.97	5035	5.52	4965	11
50	**9.62 3229**	4.55	**9.95 7863**	.98	**9.66 5366**	5.53	**10.33 4634**	**10**
51	3502	4.53	7804	.97	5698	5.52	4302	9
52	3774	4.55	7746	.98	6029	5.52	3971	8
53	4047	4.53	7687	.98	6360	5.52	3640	7
54	4319	4.53	7628	.97	6691	5.50	3309	6
55	**9.62 4591**	4.53	**9.95 7570**	.98	**9.66 7021**	5.52	**10.33 2979**	**5**
56	4863	4.53	7511	.98	7352	5.50	2648	4
57	5135	4.52	7452	.98	7682	5.52	2318	3
58	5406	4.52	7393	.97	8013	5.50	1987	2
59	5677	4.52	7335	.98	8343	5.50	1657	1
60	**9.62 5948**		**9.95 7276**		**9.66 8673**		**10.33 1327**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

114° 65°

25° 154°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.62 5948**	4.52	**9.95 7276**	.98	**9.66 8673**	5.48	**10.33 1327**	**60**
1	6219	4.52	7217	.98	9002	5.50	0998	59
2	6490	4.50	7158	.98	9332	5.48	0668	58
3	6760	4.50	7099	.98	9661	5.50	0339	57
4	7030	4.50	7040	.98	.66 9991	5.48	.33 0009	56
5	**9.62 7300**	4.50	**9.95 6981**	1.00	**9.67 0320**	5.48	**10.32 9680**	**55**
6	7570	4.50	6921	.98	0649	5.47	9351	54
7	7840	4.48	6862	.98	0977	5.48	9023	53
8	8109	4.48	6803	.98	1306	5.48	8694	52
9	8378	4.48	6744	1.00	1635	5.47	8365	51
10	**9.62 8647**	4.48	**9.95 6684**	.98	**9.67 1963**	5.47	**10.32 8037**	**50**
11	8916	4.48	6625	.98	2291	5.47	7709	49
12	9185	4.47	6566	1.00	2619	5.47	7381	48
13	9453	4.47	6506	.98	2947	5.45	7053	47
14	9721	4.47	6447	1.00	3274	5.47	6726	46
15	**9.62 9989**	4.47	**9.95 6387**	1.00	**9.67 3602**	5.45	**10.32 6398**	**45**
16	.63 0257	4.45	6327	.98	3929	5.47	6071	44
17	0524	4.47	6268	1.00	4257	5.45	5743	43
18	0792	4.45	6208	1.00	4584	5.45	5416	42
19	1059	4.45	6148	.98	4911	5.43	5089	41
20	**9.63 1326**	4.45	**9.95 6089**	1.00	**9.67 5237**	5.45	**10.32 4763**	**40**
21	1593	4.43	6029	1.00	5564	5.43	4436	39
22	1859	4.43	5969	1.00	5890	5.45	4110	38
23	2125	4.45	5909	1.00	6217	5.43	3783	37
24	2392	4.43	5849	1.00	6543	5.43	3457	36
25	**9.63 2658**	4.42	**9.95 5789**	1.00	**9.67 6869**	5.42	**10.32 3131**	**35**
26	2923	4.43	5729	1.00	7194	5.43	2806	34
27	3189	4.42	5669	1.00	7520	5.43	2480	33
28	3454	4.42	5609	.98	7846	5.42	2154	32
29	3719	4.42	5548	1.00	8171	5.42	1829	31
30	**9.63 3984**	4.42	**9.95 5488**	1.00	**9.67 8496**	5.42	**10.32 1504**	**30**
31	4249	4.42	5428	1.00	8821	5.42	1179	29
32	4514	4.40	5368	1.02	9146	5.42	0854	28
33	4778	4.40	5307	1.00	9471	5.40	0529	27
34	5042	4.40	5247	1.02	.67 9795	5.42	.32 0205	26
35	**9.63 5306**	4.40	**9.95 5186**	1.00	**9.68 0120**	5.40	**10.31 9880**	**25**
36	5570	4.40	5126	1.02	0444	5.40	9556	24
37	5834	4.38	5065	1.00	0768	5.40	9232	23
38	6097	4.38	5005	1.02	1092	5.40	8908	22
39	6360	4.38	4944	1.02	1416	5.40	8584	21
40	**9.63 6623**	4.38	**9.95 4883**	1.00	**9.68 1740**	5.38	**10.31 8260**	**20**
41	6886	4.37	4823	1.02	2063	5.40	7937	19
42	7148	4.38	4762	1.02	2387	5.38	7613	18
43	7411	4.37	4701	1.02	2710	5.38	7290	17
44	7673	4.37	4640	1.02	3033	5.38	6967	16
45	**9.63 7935**	4.37	**9.95 4579**	1.02	**9.68 3356**	5.38	**10.31 6644**	**15**
46	8197	4.35	4518	1.02	3679	5.37	6321	14
47	8458	4.37	4457	1.02	4001	5.38	5999	13
48	8720	4.35	4396	1.02	4324	5.37	5676	12
49	8981	4.35	4335	1.02	4646	5.37	5354	11
50	**9.63 9242**	4.35	**9.95 4274**	1.02	**9.68 4968**	5.37	**10.31 5032**	**10**
51	9503	4.35	4213	1.02	5290	5.37	4710	9
52	.63 9764	4.33	4152	1.03	5612	5.37	4388	8
53	.64 0024	4.33	4090	1.02	5934	5.35	4066	7
54	0284	4.33	4029	1.02	6255	5.37	3745	6
55	**9.64 0544**	4.33	**9.95 3968**	1.03	**9.68 6577**	5.35	**10.31 3423**	**5**
56	0804	4.33	3906	1.02	6898	5.35	3102	4
57	1064	4.33	3845	1.03	7219	5.35	2781	3
58	1324	4.32	3783	1.02	7540	5 35	2460	2
59	1583	4.32	3722	1.03	7861	5.35	2139	1
60	**9.64 1842**		**9.95 3660**		**9.68 8182**		**10.31 1818**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

115° 64°

26° 153°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.64 1842**	4.32	**9.95 3660**	1.02	**9.68 8182**	5.33	**10.31 1818**	**60**
1	2101	4.32	3599	1.03	8502	5.32	1498	59
2	2360	4.30	3537	1.03	8823	5.33	1177	58
3	2618	4.32	3475	1.03	9143	5.33	0857	57
4	2877	4.30	3413	1.02	9463	5.33	0537	56
5	**9.64 3135**	4.30	**9.95 3352**	1.03	**9.68 9783**	5.33	**10.31 0217**	**55**
6	3393	4.28	3290	1.03	.69 0103	5.33	.30 9897	54
7	3650	4.30	3228	1.03	0423	5.32	9577	53
8	3908	4.28	3166	1.03	0742	5.33	9258	52
9	4165	4.30	3104	1.03	1062	5.32	8938	51
10	**9.64 4423**	4.28	**9.95 3042**	1.03	**9.69 1381**	5.32	**10.30 8619**	**50**
11	4680	4.27	2980	1.03	1700	5.32	8300	49
12	4936	4.28	2918	1.05	2019	5.32	7981	48
13	5193	4.28	2855	1.03	2338	5.30	7662	47
14	5450	4.27	2793	1.03	2656	5.32	7344	46
15	**9.64 5706**	4.27	**9.95 2731**	1.03	**9.69 2975**	5.30	**10.30 7025**	**45**
16	5962	4.27	2669	1.05	3293	5.32	6707	44
17	6218	4.27	2606	1.03	3612	5.30	6388	43
18	6474	4.25	2544	1.05	3930	5.30	6070	42
19	6729	4.25	2481	1.03	4248	5.30	5752	41
20	**9.64 6984**	4.27	**9.95 2419**	1.05	**9.69 4566**	5.28	**10.30 5434**	**40**
21	7240	4.23	2356	1.03	4883	5.30	5117	39
22	7494	4.25	2294	1.05	5201	5.28	4799	38
23	7749	4.25	2231	1.05	5518	5.30	4482	37
24	8004	4.23	2168	1.03	5836	5.28	4164	36
25	**9.64 8258**	4.23	**9.95 2106**	1.05	**9.69 6153**	5.28	**10.30 3847**	**35**
26	8512	4.23	2043	1.05	6470	5.28	3530	34
27	8766	4.23	1980	1.05	6787	5.27	3213	33
28	9020	4.23	1917	1.05	7103	5.28	2897	32
29	9274	4.22	1854	1.05	7420	5.27	2580	31
30	**9.64 9527**	4.23	**9.95 1791**	1.05	**9.69 7736**	5.28	**10.30 2264**	**30**
31	.64 9781	4.22	1728	1.05	8053	5.27	1947	29
32	.65 0034	4.22	1665	1.05	8369	5.27	1631	28
33	0287	4.20	1602	1.05	8685	5.27	1315	27
34	0539	4.22	1539	1.05	9001	5.25	0999	26
35	**9.65 0792**	4.20	**9.95 1476**	1.07	**9.69 9316**	5.27	**10.30 0684**	**25**
36	1044	4.22	1412	1.05	9632	5.25	0368	24
37	1297	4.20	1349	1.05	.69 9947	5.27	.30 0053	23
38	1549	4.18	1286	1.07	.70 0263	5.25	.29 9737	22
39	1800	4.20	1222	1.05	0578	5.25	9422	21
40	**9.65 2052**	4.20	**9.95 1159**	1.05	**9.70 0893**	5.25	**10.29 9107**	**20**
41	2304	4.18	1096	1.07	1208	5.25	8792	19
42	2555	4.18	1032	1.07	1523	5.23	8477	18
43	2806	4.18	0968	1.05	1837	5.25	8163	17
44	3057	4.18	0905	1.07	2152	5.23	7848	16
45	**9.65 3308**	4.17	**9.95 0841**	1.05	**9.70 2466**	5.25	**10.29 7534**	**15**
46	3558	4.17	0778	1.07	2781	5.23	7219	14
47	3808	4.18	0714	1.07	3095	5.23	6905	13
48	4059	4.17	0650	1.07	3409	5.22	6591	12
49	4309	4.15	0586	1.07	3722	5.23	6278	11
50	**9.65 4558**	4.17	**9.95 0522**	1.07	**9.70 4036**	5.23	**10.29 5964**	**10**
51	4808	4.17	0458	1.07	4350	5.22	5650	9
52	5058	4.15	0394	1.07	4663	5.22	5337	8
53	5307	4.15	0330	1.07	4976	5.23	5024	7
54	5556	4.15	0266	1.07	5290	5.22	4710	6
55	**9.65 5805**	4.15	**9.95 0202**	1.07	**9.70 5603**	5.22	**10.29 4397**	**5**
56	6054	4.13	0138	1.07	5916	5.20	4084	4
57	6302	4.15	0074	1.07	6228	5.22	3772	3
58	6551	4.13	.95 0010	1.08	6541	5.22	3459	2
59	6799	4.13	.94 9945	1.07	6854	5.20	3146	1
60	**9.65 7047**		**9.94 9881**		**9.70 7166**		**10.29 2834**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

116° 63°

27° 152°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.65 7047	4.13	9.94 9881	1.08	9.70 7166	5.20	10.29 2834	60
1	7295	4.12	9816	1.07	7478	5.20	2522	59
2	7542	4.13	9752	1.07	7790	5.20	2210	58
3	7790	4.12	9688	1.08	8102	5.20	1898	57
4	8037	4.12	9623	1.08	8414	5.20	1586	56
5	9.65 8284	4.12	9.94 9558	1.07	9.70 8726	5.18	10.29 1274	55
6	8531	4.12	9494	1.08	9037	5.20	0963	54
7	8778	4.12	9429	1.08	9349	5.18	0651	53
8	9025	4.10	9364	1.07	9660	5.18	0340	52
9	9271	4.10	9300	1.08	.70 9971	5.18	.29 0029	51
10	9.65 9517	4.10	9.94 9235	1.08	9.71 0282	5.18	10.28 9718	50
11	.65 9763	4.10	9170	1.08	0593	5.18	9407	49
12	.66 0009	4.10	9105	1.08	0904	5.18	9096	48
13	0255	4.10	9040	1.08	1215	5.17	8785	47
14	0501	4.08	8975	1.08	1525	5.18	8475	46
15	9.66 0746	4.08	9.94 8910	1.08	9.71 1836	5.17	10.28 8164	45
16	0991	4.08	8845	1.08	2146	5.17	7854	44
17	1236	4.08	8780	1.08	2456	5.17	7544	43
18	1481	4.08	8715	1.08	2766	5.17	7234	42
19	1726	4.07	8650	1.10	3076	5.17	6924	41
20	9.66 1970	4.07	9.94 8584	1.08	9.71 3386	5.17	10.28 6614	40
21	2214	4.08	8519	1.08	3696	5.15	6304	39
22	2459	4.07	8454	1.10	4005	5.15	5995	38
23	2703	4.05	8388	1.08	4314	5.17	5686	37
24	2946	4.07	8323	1.10	4624	5.15	5376	36
25	9.66 3190	4.05	9.94 8257	1.08	9.71 4933	5.15	10.28 5067	35
26	3433	4.07	8192	1.10	5242	5.15	4758	34
27	3677	4.05	8126	1.10	5551	5.15	4449	33
28	3920	4.05	8060	1.08	5860	5.13	4140	32
29	4163	4.05	7995	1.10	6168	5.15	3832	31
30	9.66 4406	4.03	9.94 7929	1.10	9.71 6477	5.13	10.28 3523	30
31	4648	4.05	7863	1.10	6785	5.13	3215	29
32	4891	4.03	7797	1.10	7093	5.13	2907	28
33	5133	4.03	7731	1.10	7401	5.13	2599	27
34	5375	4.03	7665	1.08	7709	5.13	2291	26
35	9.66 5617	4.03	9.94 7600	1.12	9.71 8017	5.13	10.28 1983	25
36	5859	4.02	7533	1.10	8325	5.13	1675	24
37	6100	4.03	7467	1.10	8633	5.12	1367	23
38	6342	4.02	7401	1.10	8940	5.13	1060	22
39	6583	4.02	7335	1.10	9248	5.12	0752	21
40	9.66 6824	4.02	9.94 7269	1.10	9.71 9555	5.12	10.28 0445	20
41	7065	4.00	7203	1.12	.71 9862	5.12	.28 0138	19
42	7305	4.02	7136	1.10	.72 0169	5.12	.27 9831	18
43	7546	4.00	7070	1.10	0476	5.12	9524	17
44	7786	4.02	7004	1.12	0783	5.10	9217	16
45	9.66 8027	4.00	9.94 6937	1.10	9.72 1089	5.12	10.27 8911	15
46	8267	3.98	6871	1.12	1396	5.10	8604	14
47	8506	4.00	6804	1.10	1702	5.12	8298	13
48	8746	4.00	6738	1.12	2009	5.10	7991	12
49	8986	3.98	6671	1.12	2315	5.10	7685	11
50	9.66 9225	3.98	9.94 6604	1.10	9.72 2621	5.10	10.27 7379	10
51	9464	3.98	6538	1.12	2927	5.08	7073	9
52	9703	3.98	6471	1.12	3232	5.10	6768	8
53	.66 9942	3.98	6404	1.12	3538	5.10	6462	7
54	.67 0181	3.97	6337	1.12	3844	5.08	6156	6
55	9.67 0419	3.98	9.94 6270	1.12	9.72 4149	5.08	10.27 5851	5
56	0658	3.97	6203	1.12	4454	5.10	5546	4
57	0896	3.97	6136	1.12	4760	5.08	5240	3
58	1134	3.97	6069	1.12	5065	5.08	4935	2
59	1372	3.95	6002	1.12	5370	5.07	4630	1
60	9.67 1609		9.94 5935		9.72 5674		10.27 4326	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

117° 62°

28° 151°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.67 1609**	3.97	**9.94 5935**	1.12	**9.72 5674**	5.08	**10.27 4326**	**60**
1	1847	3.95	5868	1.13	5979	5.08	4021	59
2	2084	3.95	5800	1.12	6284	5.07	3716	58
3	2321	3.95	5733	1.12	6588	5.07	3412	57
4	2558	3.95	5666	1.13	6892	5.05	3108	56
5	**9.67 2795**	3.95	**9.94 5598**	1.12	**9.72 7197**	5.07	**10.27 2803**	**55**
6	3032	3.93	5531	1.12	7501	5.07	2499	54
7	3268	3.95	5464	1.13	7805	5.07	2195	53
8	3505	3.93	5396	1.13	8109	5.05	1891	52
9	3741	3.93	5328	1.12	8412	5.07	1588	51
10	**9.67 3977**	3.93	**9.94 5261**	1.13	**9.72 8716**	5.07	**10.27 1284**	**50**
11	4213	3.92	5193	1.13	9020	5.05	0980	49
12	4448	3.93	5125	1.12	9323	5.05	0677	48
13	4684	3.92	5058	1.13	9626	5.05	0374	47
14	4919	3.93	4990	1.13	.72 9929	5.07	.27 0071	46
15	**9.67 5155**	3.92	**9.94 4922**	1.13	**9.73 0233**	5.03	**10.26 9767**	**45**
16	5390	3.90	4854	1.13	0535	5.05	9465	44
17	5624	3.92	4786	1.13	0838	5.05	9162	43
18	5859	3.92	4718	1.13	1141	5.05	8859	42
19	6094	3.90	4650	1.13	1444	5.03	8556	41
20	**9.67 6328**	3.90	**9.94 4582**	1.13	**9.73 1746**	5.03	**10.26 8254**	**40**
21	6562	3.90	4514	1.13	2048	5.05	7952	39
22	6796	3.90	4446	1.15	2351	5.03	7649	38
23	7030	3.90	4377	1.13	2653	5.03	7347	37
24	7264	3.90	4309	1.13	2955	5.03	7045	36
25	**9.67 7498**	3.88	**9.94 4241**	1.15	**9.73 3257**	5.02	**10.26 6743**	**35**
26	7731	3.88	4172	1.13	3558	5.03	6442	34
27	7964	3.88	4104	1.13	3860	5.03	6140	33
28	8197	3.88	4036	1.15	4162	5.02	5838	32
29	8430	3.88	3967	1.13	4463	5.02	5537	31
30	**9.67 8663**	3.87	**9.94 3899**	1.15	**9.73 4764**	5.03	**10.26 5236**	**30**
31	8895	3.88	3830	1.15	5066	5.02	4934	29
32	9128	3.87	3761	1.13	5367	5.02	4633	28
33	9360	3.87	3693	1.15	5668	5.02	4332	27
34	9592	3.87	3624	1.15	5969	5.00	4031	26
35	**9.67 9824**	3.87	**9.94 3555**	1.15	**9.73 6269**	5.02	**10.26 3731**	**25**
36	.68 0056	3.87	3486	1.15	6570	5.00	3430	24
37	0288	3.85	3417	1.15	6870	5.02	3130	23
38	0519	3.85	3348	1.15	7171	5.00	2829	22
39	0750	3.87	3279	1.15	7471	5.00	2529	21
40	**9.68 0982**	3.85	**9.94 3210**	1.15	**9.73 7771**	5.00	**10.26 2229**	**20**
41	1213	3.83	3141	1.15	8071	5.00	1929	19
42	1443	3.85	3072	1.15	8371	5.00	1629	18
43	1674	3.85	3003	1.15	8671	5.00	1329	17
44	1905	3.83	2934	1.17	8971	5.00	1029	16
45	**9.68 2135**	3.83	**9.94 2864**	1.15	**9.73 9271**	4.98	**10.26 0729**	**15**
46	2365	3.83	2795	1.15	9570	5.00	0430	14
47	2595	3.83	2726	1.17	.73 9870	4.98	.26 0130	13
48	2825	3.83	2656	1.15	.74 0169	4.98	.25 9831	12
49	3055	3.82	2587	1.17	0468	4.98	9532	11
50	**9.68 3284**	3.83	**9.94 2517**	1.15	**9.74 0767**	4.98	**10.25 9233**	**10**
51	3514	3.82	2448	1.17	1066	4.98	8934	9
52	3743	3.82	2378	1.17	1365	4.98	8635	8
53	3972	3.82	2308	1.15	1664	4.97	8336	7
54	4201	3.82	2239	1.17	1962	4.98	8038	6
55	**9.68 4430**	3.80	**9.94 2169**	1.17	**9.74 2261**	4.97	**10.25 7739**	**5**
56	4658	3.82	2099	1.17	2559	4.98	7441	4
57	4887	3.80	2029	1.17	2858	4.97	7142	3
58	5115	3.80	1959	1.17	3156	4.97	6844	2
59	5343	3.80	1889	1.17	3454	4.97	6546	1
60	**9.68 5571**		**9.94 1819**		**9.74 3752**		**10.25 6248**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

118° 61°

29° 150°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.68 5571	3.80	9.94 1819	1.17	9.74 3752	4.97	10.25 6248	60
1	5799	3.80	1749	1.17	4050	4.97	5950	59
2	6027	3.78	1679	1.17	4348	4.95	5652	58
3	6254	3.80	1609	1.17	4645	4.97	5355	57
4	6482	3.78	1539	1.17	4943	4.95	5057	56
5	9.68 6709	3.78	9.94 1469	1.18	9.74 5240	4.97	10.25 4760	55
6	6936	3.78	1398	1.17	5538	4.95	4462	54
7	7163	3.77	1328	1.17	5835	4.95	4165	53
8	7389	3.78	1258	1.18	6132	4.95	3868	52
9	7616	3.78	1187	1.17	6429	4.95	3571	51
10	9.68 7843	3.77	9.94 1117	1.18	9.74 6726	4.95	10.25 3274	50
11	8069	3.77	1046	1.18	7023	4.93	2977	49
12	8295	3.77	0975	1.17	7319	4.95	2681	48
13	8521	3.77	0905	1.18	7616	4.95	2384	47
14	8747	3.75	0834	1.18	7913	4.93	2087	46
15	9.68 8972	3.77	9.94 0763	1.17	9.74 8209	4.93	10.25 1791	45
16	9198	3.75	0693	1.18	8505	4.93	1495	44
17	9423	3.75	0622	1.18	8801	4.93	1199	43
18	9648	3.75	0551	1.18	9097	4.93	0903	42
19	.68 9873	3.75	0480	1.18	9393	4.93	0607	41
20	9.69 0098	3.75	9.94 0409	1.18	9.74 9689	4.93	10.25 0311	40
21	0323	3.75	0338	1.18	.74 9985	4.93	.25 0015	39
22	0548	3.73	0267	1.18	.75 0281	4.92	.24 9719	38
23	0772	3.73	0196	1.18	0576	4.93	9424	37
24	0996	3.73	0125	1.18	0872	4.92	9128	36
25	9.69 1220	3.73	9.94 0054	1.20	9.75 1167	4.92	10.24 8833	35
26	1444	3.73	.93 9982	1.18	1462	4.92	8538	34
27	1668	3.73	9911	1.18	1757	4.92	8243	33
28	1892	3.72	9840	1.20	2052	4.92	7948	32
29	2115	3.73	9768	1.18	2347	4.92	7653	31
30	9.69 2339	3.72	9.93 9697	1.20	9.75 2642	4.92	10.24 7358	30
31	2562	3.72	9625	1.18	2937	4.90	7063	29
32	2785	3.72	9554	1.20	3231	4.92	6769	28
33	3008	3.72	9482	1.20	3526	4.90	6474	27
34	3231	3.70	9410	1.18	3820	4.92	6180	26
35	9.69 3453	3.72	9.93 9339	1.20	9.75 4115	4.90	10.24 5885	25
36	3676	3.70	9267	1.20	4409	4.90	5591	24
37	3898	3.70	9195	1.20	4703	4.90	5297	23
38	4120	3.70	9123	1.18	4997	4.90	5003	22
39	4342	3.70	9052	1.20	5291	4.90	4709	21
40	9.69 4564	3.70	9.93 8980	1.20	9.75 5585	4.88	10.24 4415	20
41	4786	3.68	8908	1.20	5878	4.90	4122	19
42	5007	3.70	8836	1.22	6172	4.88	3828	18
43	5229	3.68	8763	1.20	6465	4.90	3535	17
44	5450	3.68	8691	1.20	6759	4.88	3241	16
45	9.69 5671	3.68	9.93 8619	1.20	9.75 7052	4.88	10.24 2948	15
46	5892	3.68	8547	1.20	7345	4.88	2655	14
47	6113	3.68	8475	1.22	7638	4.88	2362	13
48	6334	3.67	8402	1.20	7931	4.88	2069	12
49	6554	3.68	8330	1.20	8224	4.88	1776	11
50	9.69 6775	3.67	9.93 8258	1.22	9.75 8517	4.88	10.24 1483	10
51	6995	3.67	8185	1.20	8810	4.87	1190	9
52	7215	3.67	8113	1.22	9102	4.88	0898	8
53	7435	3.65	8040	1.22	9395	4.87	0605	7
54	7654	3.67	7967	1.20	9687	4.87	0313	6
55	9.69 7874	3.67	9.93 7895	1.22	9.75 9979	4.88	10.24 0021	5
56	8094	3.65	7822	1.22	.76 0272	4.87	.23 9728	4
57	8313	3.65	7749	1.22	0564	4.87	9436	3
58	8532	3.65	7676	1.20	0856	4.87	9144	2
59	8751	3.65	7604	1.22	1148	4.85	8852	1
60	9.69 8970		9.93 7531		9.76 1439		10.23 8561	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

119° 60°

30° 149°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.69 8970**	3.65	**9.93 7531**	1.22	**9.76 1439**	4.87	**10.23 8561**	**60**
1	9189	3.63	7458	1.22	1731	4.87	8269	59
2	9407	3.65	7385	1.22	2023	4.85	7977	58
3	9626	3.63	7312	1.23	2314	4.87	7686	57
4	.69 9844	3.63	7238	1.22	2606	4.85	7394	56
5	**9.70 0062**	3.63	**9.93 7165**	1.22	**9.76 2897**	4.85	**10.23 7103**	**55**
6	0280	3.63	7092	1.22	3188	4.85	6812	54
7	0498	3.63	7019	1.22	3479	4.85	6521	53
8	0716	3.62	6946	1.23	3770	4.85	6230	52
9	0933	3.63	6872	1.22	4061	4.85	5939	51
10	**9.70 1151**	3.62	**9.93 6799**	1.23	**9.76 4352**	4.85	**10.23 5648**	**50**
11	1368	3.62	6725	1.22	4643	4.83	5357	49
12	1585	3.62	6652	1.23	4933	4.85	5067	48
13	1802	3.62	6578	1.22	5224	4.83	4776	47
14	2019	3.62	6505	1.23	5514	4.85	4486	46
15	**9.70 2236**	3.60	**9.93 6431**	1.23	**9.76 5805**	4.83	**10.23 4195**	**45**
16	2452	3.62	6357	1.22	6095	4.83	3905	44
17	2669	3.60	6284	1.23	6385	4.83	3615	43
18	2885	3.60	6210	1.23	6675	4.83	3325	42
19	3101	3.60	6136	1.23	6965	4.83	3035	41
20	**9.70 3317**	3.60	**9.93 6062**	1.23	**9.76 7255**	4.83	**10.23 2745**	**40**
21	3533	3.60	5988	1.23	7545	4.82	2455	39
22	3749	3.58	5914	1.23	7834	4.83	2166	38
23	3964	3.58	5840	1.23	8124	4.83	1876	37
24	4179	3.60	5766	1.23	8414	4.82	1586	36
25	**9.70 4395**	3.58	**9.93 5692**	1.23	**9.76 8703**	4.82	**10.23 1297**	**35**
26	4610	3.58	5618	1.25	8992	4.82	1008	34
27	4825	3.58	5543	1.23	9281	4.83	0719	33
28	5040	3.57	5469	1.23	9571	4.82	0429	32
29	5254	3.58	5395	1.25	.76 9860	4.80	.23 0140	31
30	**9.70 5469**	3.57	**9.93 5320**	1.23	**9.77 0148**	4.82	**10.22 9852**	**30**
31	5683	3.58	5246	1.25	0437	4.82	9563	29
32	5898	3.57	5171	1.23	0726	4.82	9274	28
33	6112	3.57	5097	1.25	1015	4.80	8985	27
34	6326	3.55	5022	1.23	1303	4.82	8697	26
35	**9.70 6539**	3.57	**9.93 4948**	1.25	**9.77 1592**	4.80	**10.22 8408**	**25**
36	6753	3.57	4873	1.25	1880	4.80	8120	24
37	6967	3.55	4798	1.25	2168	4.82	7832	23
38	7180	3.55	4723	1.23	2457	4.80	7543	22
39	7393	3.55	4649	1.25	2745	4.80	7255	21
40	**9.70 7606**	3.55	**9.93 4574**	1.25	**9.77 3033**	4.80	**10.22 6967**	**20**
41	7819	3.55	4499	1.25	3321	4.78	6679	19
42	8032	3.55	4424	1.25	3608	4.80	6392	18
43	8245	3.55	4349	1.25	3896	4.80	6104	17
44	8458	3.53	4274	1.25	4184	4.78	5816	16
45	**9.70 8670**	3.53	**9.93 4199**	1.27	**9.77 4471**	4.80	**10.22 5529**	**15**
46	8882	3.53	4123	1.25	4759	4.78	5241	14
47	9094	3.53	4048	1.25	5046	4.78	4954	13
48	9306	3.53	3973	1.25	5333	4.80	4667	12
49	9518	3.53	3898	1.27	5621	4.78	4379	11
50	**9.70 9730**	3.52	**9.93 3822**	1.25	**9.77 5908**	4.78	**10.22 4092**	**10**
51	.70 9941	3.53	3747	1.27	6195	4.78	3805	9
52	.71 0153	3.52	3671	1.25	6482	4.77	3518	8
53	0364	3.52	3596	1.27	6768	4.78	3232	7
54	0575	3.52	3520	1.25	7055	4.78	2945	6
55	**9.71 0786**	3.52	**9.93 3445**	1.27	**9.77 7342**	4.77	**10.22 2658**	**5**
56	0997	3.52	3369	1.27	7628	4.78	2372	4
57	1208	3.52	3293	1.27	7915	4.77	2085	3
58	1419	3.50	3217	1.27	8201	4.78	1799	2
59	1629	3.50	3141	1.25	8488	4.77	1512	1
60	**9.71 1839**		**9.93 3066**		**9.77 8774**		**10.22 1226**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

120° 59°

31° 148°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.71 1839	3.52	9.93 3066	1.27	9.77 8774	4.77	10.22 1226	60
1	2050	3.50	2990	1.27	9060	4.77	0940	59
2	2260	3.48	2914	1.27	9346	4.77	0654	58
3	2469	3.50	2838	1.27	9632	4.77	0368	57
4	2679	3.50	2762	1.28	.77 9918	4.75	.22 0082	56
5	9.71 2889	3.48	9.93 2685	1.27	9.78 0203	4.77	10.21 9797	55
6	3098	3.50	2609	1.27	0489	4.77	9511	54
7	3308	3.48	2533	1.27	0775	4.75	9225	53
8	3517	3.48	2457	1.28	1060	4.77	8940	52
9	3726	3.48	2380	1.27	1346	4.75	8654	51
10	9.71 3935	3.48	9.93 2304	1.27	9.78 1631	4.75	10.21 8369	50
11	4144	3.47	2228	1.28	1916	4.75	8084	49
12	4352	3.48	2151	1.27	2201	4.75	7799	48
13	4561	3.47	2075	1.28	2486	4.75	7514	47
14	4769	3.48	1998	1.28	2771	4.75	7229	46
15	9.71 4978	3.47	9.93 1921	1.27	9.78 3056	4.75	10.21 6944	45
16	5186	3.47	1845	1.28	3341	4.75	6659	44
17	5394	3.47	1768	1.28	3626	4.73	6374	43
18	5602	3.45	1691	1.28	3910	4.75	6090	42
19	5809	3.47	1614	1.28	4195	4.73	5805	41
20	9.71 6017	3.45	9.93 1537	1.28	9.78 4479	4.75	10.21 5521	40
21	6224	3.47	1460	1.28	4764	4.73	5236	39
22	6432	3.45	1383	1.28	5048	4.73	4952	38
23	6639	3.45	1306	1.28	5332	4.73	4668	37
24	6846	3.45	1229	1.28	5616	4.73	4384	36
25	9.71 7053	3.43	9.93 1152	1.28	9.78 5900	4.73	10.21 4100	35
26	7259	3.45	1075	1.28	6184	4.73	3816	34
27	7466	3.45	0998	1.28	6468	4.73	3532	33
28	7673	3.43	0921	1.30	6752	4.73	3248	32
29	7879	3.43	0843	1.28	7036	4.72	2964	31
30	9.71 8085	3.43	9.93 0766	1.30	9.78 7319	4.73	10.21 2681	30
31	8291	3.43	0688	1.28	7603	4.72	2397	29
32	8497	3.43	0611	1.30	7886	4.73	2114	28
33	8703	3.43	0533	1.28	8170	4.72	1830	27
34	8909	3.42	0456	1.30	8453	4.72	1547	26
35	9.71 9114	3.43	9.93 0378	1.30	9.78 8736	4.72	10.21 1264	25
36	9320	3.42	0300	1.28	9019	4.72	0981	24
37	9525	3.42	0223	1.30	9302	4.72	0698	23
38	9730	3.42	0145	1.30	9585	4.72	0415	22
39	.71 9935	3.42	.93 0067	1.30	.78 9868	4.72	.21 0132	21
40	9.72 0140	3.42	9.92 9989	1.30	9.79 0151	4.72	10.20 9849	20
41	0345	3.40	9911	1.30	0434	4.70	9566	19
42	0549	3.42	9833	1.30	0716	4.72	9284	18
43	0754	3.40	9755	1.30	0999	4.70	9001	17
44	0958	3.40	9677	1.30	1281	4.70	8719	16
45	9.72 1162	3.40	9.92 9599	1.30	9.79 1563	4.72	10.20 8437	15
46	1366	3.40	9521	1.32	1846	4.70	8154	14
47	1570	3.40	9442	1.30	2128	4.70	7872	13
48	1774	3.40	9364	1.30	2410	4.70	7590	12
49	1978	3.38	9286	1.32	2692	4.70	7308	11
50	9.72 2181	3.40	9.92 9207	1.30	9.79 2974	4.70	10.20 7026	10
51	2385	3.38	9129	1.32	3256	4.70	6744	9
52	2588	3.38	9050	1.30	3538	4.68	6462	8
53	2791	3.38	8972	1.32	3819	4.70	6181	7
54	2994	3.38	8893	1.30	4101	4.70	5899	6
55	9.72 3197	3.38	9.92 8815	1.32	9.79 4383	4.68	10.20 5617	5
56	3400	3.38	8736	1.32	4664	4.70	5336	4
57	3603	3.37	8657	1.32	4946	4.68	5054	3
58	3805	3.37	8578	1.32	5227	4.68	4773	2
59	4007	3.38	8499	1.32	5508	4.68	4492	1
60	9.72 4210		9.92 8420		9.79 5789		10.20 4211	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

121° 58°

32° 147°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.72 4210**	3.37	**9.92 8420**	1.30	**9.79 5789**	4.68	**10.20 4211**	**60**
1	4412	3.37	8342	1.32	6070	4.68	3930	59
2	4614	3.37	8263	1.33	6351	4.68	3649	58
3	4816	3.35	8183	1.32	6632	4.68	3368	57
4	5017	3.37	8104	1.32	6913	4.68	3087	56
5	**9.72 5219**	3.35	**9.92 8025**	1.32	**9.79 7194**	4.67	**10.20 2806**	**55**
6	5420	3.37	7946	1.32	7474	4.68	2526	54
7	5622	3.35	7867	1.33	7755	4.68	2245	53
8	5823	3.35	7787	1.32	8036	4.67	1964	52
9	6024	3.35	7708	1.32	8316	4.67	1684	51
10	**9.72 6225**	3.35	**9.92 7629**	1.33	**9.79 8596**	4.68	**10.20 1404**	**50**
11	6426	3.33	7549	1.32	8877	4.67	1123	49
12	6626	3.35	7470	1.33	9157	4.67	0843	48
13	6827	3.33	7390	1.33	9437	4.67	0563	47
14	7027	3.35	7310	1.32	9717	4.67	0283	46
15	**9.72 7228**	3.33	**9.92 7231**	1.33	**9.79 9997**	4.67	**10.20 0003**	**45**
16	7428	3.33	7151	1.33	.80 0277	4.67	.19 9723	44
17	7628	3.33	7071	1.33	0557	4.65	9443	43
18	7828	3.32	6991	1.33	0836	4.67	9164	42
19	8027	3.33	6911	1.33	1116	4.67	8884	41
20	**9.72 8227**	3.33	**9.92 6831**	1.33	**9.80 1396**	4.65	**10.19 8604**	**40**
21	8427	3.32	6751	1.33	1675	4.67	8325	39
22	8626	3.32	6671	1.33	1955	4.65	8045	38
23	8825	3.32	6591	1.33	2234	4.65	7766	37
24	9024	3.32	6511	1.33	2513	4.65	7487	36
25	**9.72 9223**	3.32	**9.92 6431**	1.33	**9.80 2792**	4.67	**10.19 7208**	**35**
26	9422	3.32	6351	1.35	3072	4.65	6928	34
27	9621	3.32	6270	1.33	3351	4.65	6649	33
28	.72 9820	3.30	6190	1.33	3630	4.65	6370	32
29	.73 0018	3.32	6110	1.35	3909	4.63	6091	31
30	**9.73 0217**	3.30	**9.92 6029**	1.33	**9.80 4187**	4.65	**10.19 5813**	**30**
31	0415	3.30	5949	1.35	4466	4.65	5534	29
32	0613	3.30	5868	1.33	4745	4.63	5255	28
33	0811	3.30	5788	1.35	5023	4.65	4977	27
34	1009	3.28	5707	1.35	5302	4.63	4698	26
35	**9.73 1206**	3.30	**9.92 5626**	1.35	**9.80 5580**	4.65	**10.19 4420**	**25**
36	1404	3.30	5545	1.33	5859	4.63	4141	24
37	1602	3.28	5465	1.35	6137	4.63	3863	23
38	1799	3.28	5384	1.35	6415	4.63	3585	22
39	1996	3.28	5303	1.35	6693	4.63	3307	21
40	**9.73 2193**	3.28	**9.92 5222**	1.35	**9.80 6971**	4.63	**10.19 3029**	**20**
41	2390	3.28	5141	1.35	7249	4.63	2751	19
42	2587	3.28	5060	1.35	7527	4.63	2473	18
43	2784	3.27	4979	1.37	7805	4.63	2195	17
44	2980	3.28	4897	1.35	8083	4.63	1917	16
45	**9.73 3177**	3.27	**9.92 4816**	1.35	**9.80 8361**	4.62	**10.19 1639**	**15**
46	3373	3.27	4735	1.35	8638	4.63	1362	14
47	3569	3.27	4654	1.37	8916	4.62	1084	13
48	3765	3.27	4572	1.35	9193	4.63	0807	12
49	3961	3.27	4491	1.37	9471	4.62	0529	11
50	**9.73 4157**	3.27	**9.92 4409**	1.35	**9.80 9748**	4.62	**10.19 0252**	**10**
51	4353	3.27	4328	1.37	.81 0025	4.62	.18 9975	9
52	4549	3.25	4246	1.37	0302	4.63	9698	8
53	4744	3.25	4164	1.35	0580	4.62	9420	7
54	4939	3.27	4083	1.37	0857	4.62	9143	6
55	**9.73 5135**	3.25	**9.92 4001**	1.37	**9.81 1134**	4.60	**10.18 8866**	**5**
56	5330	3.25	3919	1.37	1410	4.62	8590	4
57	5525	3.23	3837	1.37	1687	4.62	8313	3
58	5719	3.25	3755	1.37	1964	4.62	8036	2
59	5914	3.25	3673	1.37	2241	4.60	7759	1
60	**9.73 6109**		**9.92 3591**		**9.81 2517**		**10.18 7483**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

122° 57°

33° 146°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.73 6109	3.23	9.92 3591	1.37	9.81 2517	4.62	10.18 7483	60
1	6303	3.25	3509	1.37	2794	4.60	7206	59
2	6498	3.23	3427	1.37	3070	4.62	6930	58
3	6692	3.23	3345	1.37	3347	4.60	6653	57
4	6886	3.23	3263	1.37	3623	4.60	6377	56
5	9.73 7080	3.23	9.92 3181	1.38	9.81 3899	4.62	10.18 6101	55
6	7274	3.22	3098	1.37	4176	4.60	5824	54
7	7467	3.23	3016	1.38	4452	4.60	5548	53
8	7661	3.23	2933	1.37	4728	4.60	5272	52
9	7855	3.22	2851	1.38	5004	4.60	4996	51
10	9.73 8048	3.22	9.92 2768	1.37	9.81 5280	4.58	10.18 4720	50
11	8241	3.22	2686	1.38	5555	4.60	4445	49
12	8434	3.22	2603	1.38	5831	4.60	4169	48
13	8627	3.22	2520	1.37	6107	4.58	3893	47
14	8820	3.22	2438	1.38	6382	4.60	3618	46
15	9.73 9013	3.22	9.92 2355	1.38	9.81 6658	4.58	10.18 3342	45
16	9206	3.20	2272	1.38	6933	4.60	3067	44
17	9398	3.20	2189	1.38	7209	4.58	2791	43
18	9590	3.22	2106	1.38	7484	4.58	2516	42
19	9783	3.20	2023	1.38	7759	4.60	2241	41
20	9.73 9975	3.20	9.92 1940	1.38	9.81 8035	4.58	10.18 1965	40
21	.74 0167	3.20	1857	1.38	8310	4.58	1690	39
22	0359	3.18	1774	1.38	8585	4.58	1415	38
23	0550	3.20	1691	1.40	8860	4.58	1140	37
24	0742	3.20	1607	1.38	9135	4.58	0865	36
25	9.74 0934	3.18	9.92 1524	1.38	9.81 9410	4.57	10.18 0590	35
26	1125	3.18	1441	1.40	9684	4.58	0316	34
27	1316	3.20	1357	1.38	.81 9959	4.58	.18 0041	33
28	1508	3.18	1274	1.40	.82 0234	4.57	.17 9766	32
29	1699	3.17	1190	1.38	0508	4.58	9492	31
30	9.74 1889	3.18	9.92 1107	1.40	9.82 0783	4.57	10.17 9217	30
31	2080	3.18	1023	1.40	1057	4.58	8943	29
32	2271	3.18	0939	1.38	1332	4.57	8668	28
33	2462	3.17	0856	1.40	1606	4.57	8394	27
34	2652	3.17	0772	1.40	1880	4.57	8120	26
35	9.74 2842	3.18	9.92 0688	1.40	9.82 2154	4.58	10.17 7846	25
36	3033	3.17	0604	1.40	2429	4.57	7571	24
37	3223	3.17	0520	1.40	2703	4.57	7297	23
38	3413	3.15	0436	1.40	2977	4.57	7023	22
39	3602	3.17	0352	1.40	3251	4.55	6749	21
40	9.74 3792	3.17	9.92 0268	1.40	9.82 3524	4.57	10.17 6476	20
41	3982	3.15	0184	1.42	3798	4.57	6202	19
42	4171	3.17	0099	1.40	4072	4.55	5928	18
43	4361	3.15	.92 0015	1.40	4345	4.57	5655	17
44	4550	3.15	.91 9931	1.42	4619	4.57	5381	16
45	9.74 4739	3.15	9.91 9846	1.40	9.82 4893	4.55	10.17 5107	15
46	4928	3.15	9762	1.42	5166	4.55	4834	14
47	5117	3.15	9677	1.40	5439	4.57	4561	13
48	5306	3.13	9593	1.42	5713	4.55	4287	12
49	5494	3.15	9508	1.40	5986	4.55	4014	11
50	9.74 5683	3.13	9.91 9424	1.42	9.82 6259	4.55	10.17 3741	10
51	5871	3.15	9339	1.42	6532	4.55	3468	9
52	6060	3.13	9254	1.42	6805	4.55	3195	8
53	6248	3.13	9169	1.40	7078	4.55	2922	7
54	6436	3.13	9085	1.42	7351	4.55	2649	6
55	9.74 6624	3.13	9.91 9000	1.42	9.82 7624	4.55	10.17 2376	5
56	6812	3.12	8915	1.42	7897	4.55	2103	4
57	6999	3.13	8830	1.42	8170	4.53	1830	3
58	7187	3.12	8745	1.43	8442	4.55	1558	2
59	7374	3.13	8659	1.42	8715	4.53	1285	1
60	9.74 7562		9.91 8574		9.82 8987		10.17 1013	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

123° 56°

34° 145°

′	Sine.	D.1″	Cosine.	D.1″	Tang.	D.1″	Cotang.	′
0	**9.74 7562**	3.12	**9.91 8574**	1.42	**9.82 8987**	4.55	**10.17 1013**	**60**
1	7749	3.12	8489	1.42	9260	4.53	0740	59
2	7936	3.12	8404	1.43	9532	4.55	0468	58
3	8123	3.12	8318	1.42	.82 9805	4.53	.17 0195	57
4	8310	3.12	8233	1.43	.83 0077	4.53	.16 9923	56
5	**9.74 8497**	3.10	**9.91 8147**	1.42	**9.83 0349**	4.53	**10.16 9651**	**55**
6	8683	3.12	8062	1.43	0621	4.53	9379	54
7	8870	3.10	7976	1.42	0893	4.53	9107	53
8	9056	3.12	7891	1.43	1165	4.53	8835	52
9	9243	3.10	7805	1.43	1437	4.53	8563	51
10	**9.74 9429**	3.10	**9.91 7719**	1.42	**9.83 1709**	4.53	**10.16 8291**	**50**
11	9615	3.10	7634	1.43	1981	4.53	8019	49
12	9801	3.10	7548	1.43	2253	4.53	7747	48
13	.74 9987	3.08	7462	1.43	2525	4.52	7475	47
14	.75 0172	3.10	7376	1.43	2796	4.53	7204	46
15	**9.75 0358**	3.08	**9.91 7290**	1.43	**9.83 3068**	4.52	**10.16 6932**	**45**
16	0543	3.10	7204	1.43	3339	4.53	6661	44
17	0729	3.08	7118	1.43	3611	4.52	6389	43
18	0914	3.08	7032	1.43	3882	4.53	6118	42
19	1099	3.08	6946	1.45	4154	4.52	5846	41
20	**9.75 1284**	3.08	**9.91 6859**	1.43	**9.83 4425**	4.52	**10.16 5575**	**40**
21	1469	3.08	6773	1.43	4696	4.52	5304	39
22	1654	3.08	6687	1.45	4967	4.52	5033	38
23	1839	3.07	6600	1.43	5238	4.52	4762	37
24	2023	3.08	6514	1.45	5509	4.52	4491	36
25	**9.75 2208**	3.07	**9.91 6427**	1.43	**9.83 5780**	4.52	**10.16 4220**	**35**
26	2392	3.07	6341	1.45	6051	4.52	3949	34
27	2576	3.07	6254	1.45	6322	4.52	3678	33
28	2760	3.07	6167	1.43	6593	4.52	3407	32
29	2944	3.07	6081	1.45	6864	4.50	3136	31
30	**9.75 3128**	3.07	**9.91 5994**	1.45	**9.83 7134**	4.52	**10.16 2866**	**30**
31	3312	3.05	5907	1.45	7405	4.50	2595	29
32	3495	3.07	5820	1.45	7675	4.52	2325	28
33	3679	3.07	5733	1.45	7946	4.50	2054	27
34	3862	3.07	5646	1.45	8216	4.52	1784	26
35	**9.75 4046**	3.05	**9.91 5559**	1.45	**9.83 8487**	4.50	**10.16 1513**	**25**
36	4229	3.05	5472	1.45	8757	4.50	1243	24
37	4412	3.05	5385	1.47	9027	4.50	0973	23
38	4595	3.05	5297	1.45	9297	4.52	0703	22
39	4778	3.03	5210	1.45	9568	4.50	0432	21
40	**9.75 4960**	3.05	**9.91 5123**	1.47	**9.83 9838**	4.50	**10.16 0162**	**20**
41	5143	3.05	5035	1.45	.84 0108	4.50	.15 9892	19
42	5326	3.03	4948	1.47	0378	4.50	9622	18
43	5508	3.03	4860	1.45	0648	4.48	9352	17
44	5690	3.03	4773	1.47	0917	4.50	9083	16
45	**9.75 5872**	3.03	**9.91 4685**	1.45	**9.84 1187**	4.50	**10.15 8813**	**15**
46	6054	3.03	4598	1.47	1457	4.50	8543	14
47	6236	3.03	4510	1.47	1727	4.48	8273	13
48	6418	3.03	4422	1.47	1996	4.50	8004	12
49	6600	3.03	4334	1.47	2266	4.48	7734	11
50	**9.75 6782**	3.02	**9.91 4246**	1.47	**9.84 2535**	4.50	**10.15 7465**	**10**
51	6963	3.02	4158	1.47	2805	4.48	7195	9
52	7144	3.03	4070	1.47	3074	4.48	6926	8
53	7326	3.02	3982	1.47	3343	4.48	6657	7
54	7507	3.02	3894	1.47	3612	4.50	6388	6
55	**9.75 7688**	3.02	**9.91 3806**	1.47	**9.84 3882**	4.48	**10.15 6118**	**5**
56	7869	3.02	3718	1.47	4151	4.48	5849	4
57	8050	3.00	3630	1.48	4420	4.48	5580	3
58	8230	3.02	3541	1.47	4689	4.48	5311	2
59	8411	3.00	3453	1.47	4958	4.48	5042	1
60	**9.75 8591**		**9.91 3365**		**9.84 5227**		**10.15 4773**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

124° 55°

35° 144°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.75 8591	3.02	9.91 3365	1.48	9.84 5227	4.48	10.15 4773	60
1	8772	3.00	3276	1.48	5496	4.47	4504	59
2	8952	3.00	3187	1.47	5764	4.48	4236	58
3	9132	3.00	3099	1.48	6033	4.48	3967	57
4	9312	3.00	3010	1.47	6302	4.47	3698	56
5	9.75 9492	3.00	9.91 2922	1.48	9.84 6570	4.48	10.15 3430	55
6	9672	3.00	2833	1.48	6839	4.48	3161	54
7	.75 9852	2.98	2744	1.48	7108	4.47	2892	53
8	.76 0031	3.00	2655	1.48	7376	4.47	2624	52
9	0211	2.98	2566	1.48	7644	4.48	2356	51
10	9.76 0390	2.98	9.91 2477	1.48	9.84 7913	4.47	10.15 2087	50
11	0569	2.98	2388	1.48	8181	4.47	1819	49
12	0748	2.98	2299	1.48	8449	4.47	1551	48
13	0927	2.98	2210	1.48	8717	4.48	1283	47
14	1106	2.98	2121	1.50	8986	4.47	1014	46
15	9.76 1285	2.98	9.91 2031	1.48	9.84 9254	4.47	10.15 0746	45
16	1464	2.97	1942	1.48	9522	4.47	0478	44
17	1642	2.98	1853	1.50	.84 9790	4.45	.15 0210	43
18	1821	2.97	1763	1.48	.85 0057	4.47	.14 9943	42
19	1999	2.97	1674	1.50	0325	4.47	9675	41
20	9.76 2177	2.98	9.91 1584	1.48	9.85 0593	4.47	10.14 9407	40
21	2356	2.97	1495	1.50	0861	4.47	9139	39
22	2534	2.97	1405	1.50	1129	4.45	8871	38
23	2712	2.95	1315	1.48	1396	4.47	8604	37
24	2889	2.97	1226	1.50	1664	4.45	8336	36
25	9.76 3067	2.97	9.91 1136	1.50	9.85 1931	4.47	10.14 8069	35
26	3245	2.95	1046	1.50	2199	4.45	7801	34
27	3422	2.97	0956	1.50	2466	4.45	7534	33
28	3600	2.95	0866	1.50	2733	4.47	7267	32
29	3777	2.95	0776	1.50	3001	4.45	6999	31
30	9.76 3954	2.95	9.91 0686	1.50	9.85 3268	4.45	10.14 6732	30
31	4131	2.95	0596	1.50	3535	4.45	6465	29
32	4308	2.95	0506	1.52	3802	4.45	6198	28
33	4485	2.95	0415	1.50	4069	4.45	5931	27
34	4662	2.93	0325	1.50	4336	4.45	5664	26
35	9.76 4838	2.95	9.91 0235	1.52	9.85 4603	4.45	10.14 5397	25
36	5015	2.93	0144	1.50	4870	4.45	5130	24
37	5191	2.93	.91 0054	1.52	5137	4.45	4863	23
38	5367	2.95	.90 9963	1.50	5404	4.45	4596	22
39	5544	2.93	9873	1.52	5671	4.45	4329	21
40	9.76 5720	2.93	9.90 9782	1.52	9.85 5938	4.43	10.14 4062	20
41	5896	2.93	9691	1.50	6204	4.45	3796	19
42	6072	2.92	9601	1.52	6471	4.43	3529	18
43	6247	2.93	9510	1.52	6737	4.45	3263	17
44	6423	2.92	9419	1.52	7004	4.43	2996	16
45	9.76 6598	2.93	9.90 9328	1.52	9.85 7270	4.45	10.14 2730	15
46	6774	2.92	9237	1.52	7537	4.43	2463	14
47	6949	2.92	9146	1.52	7803	4.43	2197	13
48	7124	2.93	9055	1.52	8069	4.45	1931	12
49	7300	2.92	8964	1.52	8336	4.43	1664	11
50	9.76 7475	2.90	9.90 8873	1.53	9.85 8602	4.43	10.14 1398	10
51	7649	2.92	8781	1.52	8868	4.43	1132	9
52	7824	2.92	8690	1.52	9134	4.43	0866	8
53	7999	2.90	8599	1.53	9400	4.43	0600	7
54	8173	2.92	8507	1.52	9666	4.43	0334	6
55	9.76 8348	2.90	9.90 8416	1.53	9.85 9932	4.43	10.14 0068	5
56	8522	2.92	8324	1.52	.86 0198	4.43	.13 9802	4
57	8697	2.90	8233	1.53	0464	4.43	9536	3
58	8871	2.90	8141	1.53	0730	4.42	9270	2
59	9045	2.90	8049	1.52	0995	4.43	9005	1
60	9.76 9219		9.90 7958		9.86 1261		10.13 8739	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

125° 54°

36° 143°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.76 9219	2.90	9.90 7958	1.53	9.86 1261	4.43	10.13 8739	60
1	9393	2.88	7866	1.53	1527	4.42	8473	59
2	9566	2.90	7774	1.53	1792	4.43	8208	58
3	9740	2.88	7682	1.53	2058	4.42	7942	57
4	.76 9913	2.90	7590	1.53	2323	4.43	7677	56
5	9.77 0087	2.88	9.90 7498	1.53	9.86 2589	4.42	10.13 7411	55
6	0260	2.88	7406	1.53	2854	4.42	7146	54
7	0433	2.88	7314	1.53	3119	4.43	6881	53
8	0606	2.88	7222	1.55	3385	4.42	6615	52
9	0779	2.88	7129	1.53	3650	4.42	6350	51
10	9.77 0952	2.88	9.90 7037	1.53	9.86 3915	4.42	10.13 6085	50
11	1125	2.88	6945	1.55	4180	4.42	5820	49
12	1298	2.87	6852	1.53	4445	4.42	5555	48
13	1470	2.88	6760	1.55	4710	4.42	5290	47
14	1643	2.87	6667	1.53	4975	4.42	5025	46
15	9.77 1815	2.87	9.90 6575	1.55	9.86 5240	4.42	10.13 4760	45
16	1987	2.87	6482	1.55	5505	4.42	4495	44
17	2159	2.87	6389	1.55	5770	4.42	4230	43
18	2331	2.87	6296	1.53	6035	4.42	3965	42
19	2503	2.87	6204	1.55	6300	4.40	3700	41
20	9.77 2675	2.87	9.90 6111	1.55	9.86 6564	4.42	10.13 3436	40
21	2847	2.85	6018	1.55	6829	4.42	3171	39
22	3018	2.87	5925	1.55	7094	4.40	2906	38
23	3190	2.85	5832	1.55	7358	4.42	2642	37
24	3361	2.87	5739	1.57	7623	4.40	2377	36
25	9.77 3533	2.85	9.90 5645	1.55	9.86 7887	4.42	10.13 2113	35
26	3704	2.85	5552	1.55	8152	4.40	1848	34
27	3875	2.85	5459	1.55	8416	4.40	1584	33
28	4046	2.85	5366	1.57	8680	4.42	1320	32
29	4217	2.85	5272	1.55	8945	4.40	1055	31
30	9.77 4388	2.83	9.90 5179	1.57	9.86 9209	4.40	10.13 0791	30
31	4558	2.85	5085	1.55	9473	4.40	0527	29
32	4729	2.83	4992	1.57	.86 9737	4.40	.13 0263	28
33	4899	2.85	4898	1.57	.87 0001	4.40	.12 9999	27
34	5070	2.83	4804	1.55	0265	4.40	9735	26
35	9.77 5240	2.83	9.90 4711	1.57	9.87 0529	4.40	10.12 9471	25
36	5410	2.83	4617	1.57	0793	4.40	9207	24
37	5580	2.83	4523	1.57	1057	4.40	8943	23
38	5750	2.83	4429	1.57	1321	4.40	8679	22
39	5920	2.83	4335	1.57	1585	4.40	8415	21
40	9.77 6090	2.82	9.90 4241	1.57	9.87 1849	4.38	10.12 8151	20
41	6259	2.83	4147	1.57	2112	4.40	7888	19
42	6429	2.82	4053	1.57	2376	4.40	7624	18
43	6598	2.83	3959	1.58	2640	4.38	7360	17
44	6768	2.82	3864	1.57	2903	4.40	7097	16
45	9.77 6937	2.82	9.90 3770	1.57	9.87 3167	4.38	10.12 6833	15
46	7106	2.82	3676	1.58	3430	4.40	6570	14
47	7275	2.82	3581	1.57	3694	4.38	6306	13
48	7444	2.82	3487	1.58	3957	4.38	6043	12
49	7613	2.80	3392	1.57	4220	4.40	5780	11
50	9.77 7781	2.82	9.90 3298	1.58	9.87 4484	4.38	10.12 5516	10
51	7950	2.82	3203	1.58	4747	4.38	5253	9
52	8119	2.80	3108	1.57	5010	4.38	4990	8
53	8287	2.80	3014	1.58	5273	4.40	4727	7
54	8455	2.82	2919	1.58	5537	4.38	4463	6
55	9.77 8624	2.80	9.90 2824	1.58	9.87 5800	4.38	10.12 4200	5
56	8792	2.80	2729	1.58	6063	4.38	3937	4
57	8960	2.80	2634	1.58	6326	4.38	3674	3
58	9128	2.78	2539	1.58	6589	4.38	3411	2
59	9295	2.80	2444	1.58	6852	4.37	3148	1
60	9.77 9463		9.90 2349		9.87 7114		10.12 2886	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

126° 53°

37° 142°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.77 9463**	2.80	**9.90 2349**	1.60	**9.87 7114**	4.38	**10.12 2886**	**60**
1	9631	2.78	2253	1.58	7377	4.38	2623	59
2	9798	2.80	2158	1.58	7640	4.38	2360	58
3	.77 9966	2.78	2063	1.60	7903	4.37	2097	57
4	.78 0133	2.78	1967	1.58	8165	4.38	1835	56
5	**9.78 0300**	2.78	**9.90 1872**	1.60	**9.87 8428**	4.38	**10.12 1572**	**55**
6	0467	2.78	1776	1.58	8691	4.37	1309	54
7	0634	2.78	1681	1.60	8953	4.38	1047	53
8	0801	2.78	1585	1.58	9216	4.37	0784	52
9	0968	2.77	1490	1.60	9478	4.38	0522	51
10	**9.78 1134**	2.78	**9.90 1394**	1.60	**9.87 9741**	4.37	**10.12 0259**	**50**
11	1301	2.78	1298	1.60	.88 0003	4.37	.11 9997	49
12	1468	2.77	1202	1.60	0265	4.38	9735	48
13	1634	2.77	1106	1.60	0528	4.37	9472	47
14	1800	2.77	1010	1.60	0790	4.37	9210	46
15	**9.78 1966**	2.77	**9.90 0914**	1.60	**9.88 1052**	4.37	**10.11 8948**	**45**
16	2132	2.77	0818	1.60	1314	4.38	8686	44
17	2298	2.77	0722	1.60	1577	4.37	8423	43
18	2464	2.77	0626	1.62	1839	4.37	8161	42
19	2630	2.77	0529	1.60	2101	4.37	7899	41
20	**9.78 2796**	2.75	**9.90 0433**	1.60	**9.88 2363**	4.37	**10.11 7637**	**40**
21	2961	2.77	0337	1.62	2625	4.37	7375	39
22	3127	2.75	0240	1.60	2887	4.35	7113	38
23	3292	2.77	0144	1.62	3148	4.37	6852	37
24	3458	2.75	.90 0047	1.60	3410	4.37	6590	36
25	**9.78 3623**	2.75	**9.89 9951**	1.62	**9.88 3672**	4.37	**10.11 6328**	**35**
26	3788	2.75	9854	1.62	3934	4.37	6066	34
27	3953	2.75	9757	1.62	4196	4.35	5804	33
28	4118	2.73	9660	1.60	4457	4.37	5543	32
29	4282	2.75	9564	1.62	4719	4.35	5281	31
30	**9.78 4447**	2.75	**9.89 9467**	1.62	**9.88 4980**	4.37	**10.11 5020**	**30**
31	4612	2.73	9370	1.62	5242	4.37	4758	29
32	4776	2.75	9273	1.62	5504	4.35	4496	28
33	4941	2.73	9176	1.63	5765	4.35	4235	27
34	5105	2.73	9078	1.62	6026	4.37	3974	26
35	**9.78 5269**	2.73	**9.89 8981**	1.62	**9.88 6288**	4.35	**10.11 3712**	**25**
36	5433	2.73	8884	1.62	6549	4.37	3451	24
37	5597	2.73	8787	1.63	6811	4.35	3189	23
38	5761	2.73	8689	1.62	7072	4.35	2928	22
39	5925	2.73	8592	1.63	7333	4.35	2667	21
40	**9.78 6089**	2.72	**9.89 8494**	1.62	**9.88 7594**	4.35	**10.11 2406**	**20**
41	6252	2.73	8397	1.63	7855	4.35	2145	19
42	6416	2.72	8299	1.62	8116	4.37	1884	18
43	6579	2.72	8202	1.63	8378	4.35	1622	17
44	6742	2.73	8104	1.63	8639	4.35	1361	16
45	**9.78 6906**	2.72	**9.89 8006**	1.63	**9.88 8900**	4.35	**10.11 1100**	**15**
46	7069	2.72	7908	1.63	9161	4.33	0839	14
47	7232	2.72	7810	1.63	9421	4.35	0579	13
48	7395	2.70	7712	1.63	9682	4.35	0318	12
49	7557	2.72	7614	1.63	.88 9943	4.35	.11 0057	11
50	**9.78 7720**	2.72	**9.89 7516**	1.63	**9.89 0204**	4.35	**10.10 9796**	**10**
51	7883	2.70	7418	1.63	0465	4.33	9535	9
52	8045	2.72	7320	1.63	0725	4.35	9275	8
53	8208	2.70	7222	1.65	0986	4.35	9014	7
54	8370	2.70	7123	1.63	1247	4.33	8753	6
55	**9.78 8532**	2.70	**9.89 7025**	1.65	**9.89 1507**	4.35	**10.10 8493**	**5**
56	8694	2.70	6926	1.63	1768	4.33	8232	4
57	8856	2.70	6828	1.65	2028	4.35	7972	3
58	9018	2.70	6729	1.63	2289	4.33	7711	2
59	9180	2.70	6631	1.65	2549	4.35	7451	1
60	**9 78 9342**		**9.89 6532**		**9.89 2810**		**10.10 7190**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

127° 52°

38° 141°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	9.78 9342	2.70	9.89 6532	1.65	9.89 2810	4.33	10.10 7190	60
1	9504	2.68	6433	1.63	3070	4.35	6930	59
2	9665	2.70	6335	1.65	3331	4.33	6669	58
3	9827	2.68	6236	1.65	3591	4.33	6409	57
4	.78 9988	2.68	6137	1.65	3851	4.33	6149	56
5	9.79 0149	2.68	9.89 6038	1.65	9.89 4111	4.35	10.10 5889	55
6	0310	2.68	5939	1.65	4372	4.33	5628	54
7	0471	2.68	5840	1.65	4632	4.33	5368	53
8	0632	2.68	5741	1.67	4892	4.33	5108	52
9	0793	2.68	5641	1.65	5152	4.33	4848	51
10	9.79 0954	2.68	9.89 5542	1.65	9.89 5412	4.33	10.10 4588	50
11	1115	2.67	5443	1.67	5672	4.33	4328	49
12	1275	2.68	5343	1.65	5932	4.33	4068	48
13	1436	2.67	5244	1.65	6192	4.33	3808	47
14	1596	2.68	5145	1.67	6452	4.33	3548	46
15	9.79 1757	2.67	9.89 5045	1.67	9.89 6712	4.32	10.10 3288	45
16	1917	2.67	4945	1.65	6971	4.33	3029	44
17	2077	2.67	4846	1.67	7231	4.33	2769	43
18	2237	2.67	4746	1.67	7491	4.33	2509	42
19	2397	2.67	4646	1.67	7751	4.32	2249	41
20	9.79 2557	2.65	9.89 4546	1.67	9.89 8010	4.33	10.10 1990	40
21	2716	2.67	4446	1.67	8270	4.33	1730	39
22	2876	2.65	4346	1.67	8530	4.32	1470	38
23	3035	2.67	4246	1.67	8789	4.33	1211	37
24	3195	2.65	4146	1.67	9049	4.32	0951	36
25	9.79 3354	2.67	9.89 4046	1.67	9.89 9308	4.33	10.10 0692	35
26	3514	2.65	3946	1.67	9568	4.32	0432	34
27	3673	2.65	3846	1.68	.89 9827	4.33	.10 0173	33
28	3832	2.65	3745	1.67	.90 0087	4.32	.09 9913	32
29	3991	2.65	3645	1.68	0346	4.32	9654	31
30	9.79 4150	2.63	9.89 3544	1.67	9.90 0605	4.32	10.09 9395	30
31	4308	2.65	3444	1.68	0864	4.33	9136	29
32	4467	2.65	3343	1.67	1124	4.32	8876	28
33	4626	2.63	3243	1.68	1383	4.32	8617	27
34	4784	2.63	3142	1.68	1642	4.32	8358	26
35	9.79 4942	2.65	9.89 3041	1.68	9.90 1901	4.32	10.09 8099	25
36	5101	2.63	2940	1.68	2160	4.33	7840	24
37	5259	2.63	2839	1.67	2420	4.32	7580	23
38	5417	2.63	2739	1.68	2679	4.32	7321	22
39	5575	2.63	2638	1.70	2938	4.32	7062	21
40	9.79 5733	2.63	9.89 2536	1.68	9.90 3197	4.32	10.09 6803	20
41	5891	2.63	2435	1.68	3456	4.30	6544	19
42	6049	2.62	2334	1.68	3714	4.32	6286	18
43	6206	2.63	2233	1.68	3973	4.32	6027	17
44	6364	2.62	2132	1.70	4232	4.32	5768	16
45	9.79 6521	2.63	9.89 2030	1.68	9.90 4491	4.32	10.09 5509	15
46	6679	2.62	1929	1.70	4750	4.30	5250	14
47	6836	2.62	1827	1.68	5008	4.32	4992	13
48	6993	2.62	1726	1.70	5267	4.32	4733	12
49	7150	2.62	1624	1.68	5526	4.32	4474	11
50	9.79 7307	2.62	9.89 1523	1.70	9.90 5785	4.30	10.09 4215	10
51	7464	2.62	1421	1.70	6043	4.32	3957	9
52	7621	2.60	1319	1.70	6302	4.30	3698	8
53	7777	2.62	1217	1.70	6560	4.32	3440	7
54	7934	2.62	1115	1.70	6819	4.30	3181	6
55	9.79 8091	2.60	9.89 1013	1.70	9.90 7077	4.32	10.09 2923	5
56	8247	2.60	0911	1.70	7336	4.30	2664	4
57	8403	2.62	0809	1.70	7594	4.32	2406	3
58	8560	2.60	0707	1.70	7853	4.30	2147	2
59	8716	2.60	0605	1.70	8111	4.30	1889	1
60	9.79 8872		9.89 0503		9.90 8369		10.09 1631	0
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

128° 51°

39° 140°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.79 8872**	2.60	**9.89 0503**	1.72	**9.90 8369**	4.32	**10.09 1631**	**60**
1	9028	2.60	0400	1.70	8628	4.30	1372	59
2	9184	2.58	0298	1.72	8886	4.30	1114	58
3	9339	2.60	0195	1.70	9144	4.30	0856	57
4	9495	2.60	.89 0093	1.72	9402	4.30	0598	56
5	**9.79 9651**	2.58	**9.88 9990**	1.70	**9.90 9660**	4.30	**10.09 0340**	**55**
6	9806	2.60	9888	1.72	.90 9918	4.32	.09 0082	54
7	.79 9962	2.58	9785	1.72	.91 0177	4.30	.08 9823	53
8	.80 0117	2.58	9682	1.72	0435	4.30	9565	52
9	0272	2.58	9579	1.70	0693	4.30	9307	51
10	**9.80 0427**	2.58	**9.88 9477**	1.72	**9.91 0951**	4.30	**10.08 9049**	**50**
11	0582	2.58	9374	1.72	1209	4.30	8791	49
12	0737	2.58	9271	1.72	1467	4.30	8533	48
13	0892	2.58	9168	1.73	1725	4.28	8275	47
14	1047	2.57	9064	1.72	1982	4.30	8018	46
15	**9.80 1201**	2.58	**9.88 8961**	1.72	**9.91 2240**	4.30	**10.08 7760**	**45**
16	1356	2.58	8858	1.72	2498	4.30	7502	44
17	1511	2.57	8755	1.73	2756	4.30	7244	43
18	1665	2.57	8651	1.72	3014	4.28	6986	42
19	1819	2.57	8548	1.73	3271	4.30	6729	41
20	**9.80 1973**	2.58	**9.88 8444**	1.72	**9.91 3529**	4.30	**10.08 6471**	**40**
21	2128	2.57	8341	1.73	3787	4.28	6213	39
22	2282	2.57	8237	1.72	4044	4.30	5956	38
23	2436	2.55	8134	1.73	4302	4.30	5698	37
24	2589	2.57	8030	1.73	4560	4.28	5440	36
25	**9.80 2743**	2.57	**9.88 7926**	1.73	**9.91 4817**	4.30	**10.08 5183**	**35**
26	2897	2.55	7822	1.73	5075	4.28	4925	34
27	3050	2.57	7718	1.73	5332	4.30	4668	33
28	3204	2.55	7614	1.73	5590	4.28	4410	32
29	3357	2.57	7510	1.73	5847	4.28	4153	31
30	**9.80 3511**	2.55	**9.88 7406**	1.73	**9.91 6104**	4.30	**10.08 3896**	**30**
31	3664	2.55	7302	1.73	6362	4.28	3638	29
32	3817	2.55	7198	1.75	6619	4.30	3381	28
33	3970	2.55	7093	1.73	6877	4.28	3123	27
34	4123	2.55	6989	1.73	7134	4.28	2866	26
35	**9.80 4276**	2.55	**9.88 6885**	1.75	**9.91 7391**	4.28	**10.08 2609**	**25**
36	4428	2.55	6780	1.73	7648	4.30	2352	24
37	4581	2.55	6676	1.75	7906	4.28	2094	23
38	4734	2.53	6571	1.75	8163	4.28	1837	22
39	4886	2.55	6466	1.73	8420	4.28	1580	21
40	**9.80 5039**	2.53	**9.88 6362**	1.75	**9.91 8677**	4.28	**10.08 1323**	**20**
41	5191	2.53	6257	1.75	8934	4.28	1066	19
42	5343	2.53	6152	1.75	9191	4.28	0809	18
43	5495	2.53	6047	1.75	9448	4.28	0552	17
44	5647	2.53	5942	1.75	9705	4.28	0295	16
45	**9.80 5799**	2.53	**9.88 5837**	1.75	**9.91 9962**	4.28	**10.08 0038**	**15**
46	5951	2.53	5732	1.75	.92 0219	4.28	.07 9781	14
47	6103	2.52	5627	1.75	0476	4.28	9524	13
48	6254	2.53	5522	1.77	0733	4.28	9267	12
49	6406	2.52	5416	1.75	0990	4.28	9010	11
50	**9.80 6557**	2.53	**9.88 5311**	1.77	**9.92 1247**	4.27	**10.07 8753**	**10**
51	6709	2.52	5205	1.75	1503	4.28	8497	9
52	6860	2.52	5100	1.77	1760	4.28	8240	8
53	7011	2.53	4994	1.75	2017	4.28	7983	7
54	7163	2.52	4889	1.77	2274	4.27	7726	6
55	**9.80 7314**	2.52	**9.88 4783**	1.77	**9.92 2530**	4.28	**10.07 7470**	**5**
56	7465	2.50	4677	1.75	2787	4.28	7213	4
57	7615	2.52	4572	1.77	3044	4.27	6956	3
58	7766	2.52	4466	1.77	3300	4.28	6700	2
59	7917	2.50	4360	1.77	3557	4.28	6443	1
60	**9.80 8067**		**9.88 4254**		**9.92 3814**		**10.07 6186**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

129° 50°

40° 139°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.80 8067**	2.52	**9.88 4254**	1.77	**9.92 3814**	4.27	**10.07 6186**	**60**
1	8218	2.50	4148	1.77	4070	4.28	5930	59
2	8368	2.52	4042	1.77	4327	4.27	5673	58
3	8519	2.50	3936	1.78	4583	4.28	5417	57
4	8669	2.50	3829	1.77	4840	4.27	5160	56
5	**9.80 8819**	2.50	**9.88 3723**	1.77	**9.92 5096**	4.27	**10.07 4904**	**55**
6	8969	2.50	3617	1.78	5352	4.28	4648	54
7	9119	2.50	3510	1.77	5609	4.27	4391	53
8	9269	2.50	3404	1.78	5865	4.28	4135	52
9	9419	2.50	3297	1.77	6122	4.27	3878	51
10	**9.80 9569**	2.48	**9.88 3191**	1.78	**9.92 6378**	4.27	**10.07 3622**	**50**
11	9718	2.50	3084	1.78	6634	4.27	3366	49
12	.80 9868	2.48	2977	1.77	6890	4.28	3110	48
13	.81 0017	2.50	2871	1.78	7147	4.27	2853	47
14	0167	2.48	2764	1.78	7403	4.27	2597	46
15	**9.81 0316**	2.48	**9.88 2657**	1.78	**9.92 7659**	4.27	**10.07 2341**	**45**
16	0465	2.48	2550	1.78	7915	4.27	2085	44
17	0614	2.48	2443	1.78	8171	4.27	1829	43
18	0763	2.48	2336	1.78	8427	4.28	1573	42
19	0912	2.48	2229	1.80	8684	4.27	1316	41
20	**9.81 1061**	2.48	**9.88 2121**	1.78	**9.92 8940**	4.27	**10.07 1060**	**40**
21	1210	2.47	2014	1.78	9196	4.27	0804	39
22	1358	2.48	1907	1.80	9452	4.27	0548	38
23	1507	2.47	1799	1.78	9708	4.27	0292	37
24	1655	2.48	1692	1.80	.92 9964	4.27	.07 0036	36
25	**9.81 1804**	2.47	**9.88 1584**	1.78	**9.93 0220**	4.25	**10.06 9780**	**35**
26	1952	2.47	1477	1.80	0475	4.27	9525	34
27	2100	2.47	1369	1.80	0731	4.27	9269	33
28	2248	2.47	1261	1.80	0987	4.27	9013	32
29	2396	2.47	1153	1.78	1243	4.27	8757	31
30	**9.81 2544**	2.47	**9.88 1046**	1.80	**9.93 1499**	4.27	**10.06 8501**	**30**
31	2692	2.47	0938	1.80	1755	4.25	8245	29
32	2840	2.47	0830	1.80	2010	4.27	7990	28
33	2988	2.45	0722	1.82	2266	4.27	7734	27
34	3135	2.47	0613	1.80	2522	4.27	7478	26
35	**9.81 3283**	2.45	**9.88 0505**	1.80	**9.93 2778**	4.25	**10.06 7222**	**25**
36	3430	2.47	0397	1.80	3033	4.27	6967	24
37	3578	2.45	0289	1.82	3289	4.27	6711	23
38	3725	2.45	0180	1.80	3545	4.25	6455	22
39	3872	2.45	.88 0072	1.82	3800	4.27	6200	21
40	**9.81 4019**	2.45	**9.87 9963**	1.80	**9.93 4056**	4.25	**10.06 5944**	**20**
41	4166	2.45	9855	1.82	4311	4.27	5689	19
42	4313	2.45	9746	1.82	4567	4.25	5433	18
43	4460	2.45	9637	1.80	4822	4.27	5178	17
44	4607	2.43	9529	1.82	5078	4.25	4922	16
45	**9.81 4753**	2.45	**9.87 9420**	1.82	**9.93 5333**	4.27	**10.06 4667**	**15**
46	4900	2.43	9311	1.82	5589	4.25	4411	14
47	5046	2.45	9202	1.82	5844	4.27	4156	13
48	5193	2.43	9093	1.82	6100	4.25	3900	12
49	5339	2.43	8984	1.82	6355	4.27	3645	11
50	**9.81 5485**	2.45	**9.87 8875**	1.82	**9.93 6611**	4.25	**10.06 3389**	**10**
51	5632	2.43	8766	1.83	6866	4.25	3134	9
52	5778	2.43	8656	1.82	7121	4.27	2879	8
53	5924	2.42	8547	1.82	7377	4.25	2623	7
54	6069	2.43	8438	1.83	7632	4.25	2368	6
55	**9.81 6215**	2.43	**9.87 8328**	1.82	**9.93 7887**	4.25	**10.06 2113**	**5**
56	6361	2.43	8219	1.83	8142	4.27	1858	4
57	6507	2.42	8109	1.83	8398	4.25	1602	3
58	6652	2.43	7999	1.82	8653	4.25	1347	2
59	6798	2.42	7890	1.83	8908	4.25	1092	1
60	**9.81 6943**		**9.87 7780**		**9.93 9163**		**10.06 0837**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

130° 49°

41° 138°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.81 6943**	2.42	**9.87 7780**	1.83	**9.93 9163**	4.25	**10.06 0837**	**60**
1	7088	2.42	7670	1.83	9418	4.25	0582	59
2	7233	2.43	7560	1.83	9673	4.25	0327	58
3	7379	2.42	7450	1.83	.93 9928	4.25	.06 0072	57
4	7524	2.40	7340	1.83	.94 0183	4.27	.05 9817	56
5	**9.81 7668**	2.42	**9.87 7230**	1.83	**9.94 0439**	4.25	**10.05 9561**	**55**
6	7813	2.42	7120	1.83	0694	4.25	9306	54
7	7958	2.42	7010	1.85	0949	4.25	9051	53
8	8103	2.40	6899	1.83	1204	4.25	8796	52
9	8247	2.42	6789	1.85	1459	4.23	8541	51
10	**9.81 8392**	2.40	**9.87 6678**	1.83	**9.94 1713**	4.25	**10.05 8287**	**50**
11	8536	2.42	6568	1.85	1968	4.25	8032	49
12	8681	2.40	6457	1.83	2223	4.25	7777	48
13	8825	2.40	6347	1.85	2478	4.25	7522	47
14	8969	2.40	6236	1.85	2733	4.25	7267	46
15	**9.81 9113**	2.40	**9.87 6125**	1.85	**9.94 2988**	4.25	**10.05 7012**	**45**
16	9257	2.40	6014	1.83	3243	4.25	6757	44
17	9401	2.40	5904	1.85	3498	4.23	6502	43
18	9545	2.40	5793	1.85	3752	4.25	6248	42
19	9689	2.38	5682	1.85	4007	4.25	5993	41
20	**9.81 9832**	2.40	**9.87 5571**	1.87	**9.94 4262**	4.25	**10.05 5738**	**40**
21	.81 9976	2.40	5459	1.85	4517	4.23	5483	39
22	.82 0120	2.38	5348	1.85	4771	4.25	5229	38
23	0263	2.38	5237	1.85	5026	4.25	4974	37
24	0406	2.40	5126	1.87	5281	4.23	4719	36
25	**9.82 0550**	2.38	**9.87 5014**	1.85	**9.94 5535**	4.25	**10.05 4465**	**35**
26	0693	2.38	4903	1.87	5790	4.25	4210	34
27	0836	2.38	4791	1.85	6045	4.23	3955	33
28	0979	2.38	4680	1.87	6299	4.25	3701	32
29	1122	2.38	4568	1.87	6554	4.23	3446	31
30	**9.82 1265**	2.37	**9.87 4456**	1.87	**9.94 6808**	4.25	**10.05 3192**	**30**
31	1407	2.38	4344	1.87	7063	4.25	2937	29
32	1550	2.38	4232	1.85	7318	4.23	2682	28
33	1693	2.37	4121	1.87	7572	4.25	2428	27
34	1835	2.37	4009	1.88	7827	4.23	2173	26
35	**9.82 1977**	2.38	**9.87 3896**	1.87	**9.94 8081**	4.23	**10.05 1919**	**25**
36	2120	2.37	3784	1.87	8335	4.25	1665	24
37	2262	2.37	3672	1.87	8590	4.23	1410	23
38	2404	2.37	3560	1.87	8844	4.25	1156	22
39	2546	2.37	3448	1.88	9099	4.23	0901	21
40	**9.82 2688**	2.37	**9.87 3335**	1.87	**9.94 9353**	4.25	**10.05 0647**	**20**
41	2830	2.37	3223	1.88	9608	4.23	0392	19
42	2972	2.37	3110	1.87	.94 9862	4.23	.05 0138	18
43	3114	2.35	2998	1.88	.95 0116	4.25	.04 9884	17
44	3255	2.37	2885	1.88	0371	4.23	9629	16
45	**9.82 3397**	2.37	**9.87 2772**	1.88	**9.95 0625**	4.23	**10.04 9375**	**15**
46	3539	2.35	2659	1.87	0879	4.23	9121	14
47	3680	2.35	2547	1.88	1133	4.25	8867	13
48	3821	2.37	2434	1.88	1388	4.23	8612	12
49	3963	2.35	2321	1.88	1642	4.23	8358	11
50	**9.82 4104**	2.35	**9.87 2208**	1.88	**9.95 1896**	4.23	**10.04 8104**	**10**
51	4245	2.35	2095	1.90	2150	4.25	7850	9
52	4386	2.35	1981	1.88	2405	4.23	7595	8
53	4527	2.35	1868	1.88	2659	4.23	7341	7
54	4668	2.33	1755	1.90	2913	4.23	7087	6
55	**9.82 4808**	2.35	**9.87 1641**	1.88	**9.95 3167**	4.23	**10.04 6833**	**5**
56	4949	2.35	1528	1.90	3421	4.23	6579	4
57	5090	2.33	1414	1.88	3675	4.23	6325	3
58	5230	2.35	1301	1.90	3929	4.23	6071	2
59	5371	2.33	1187	1.90	4183	4.23	5817	1
60	**9.82 5511**		**9.87 1073**		**9.95 4437**		**10.04 5563**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

131° 48°

42° 137°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.82 5511**	2.33	**9.87 1073**	1.88	**9.95 4437**	4.23	**10.04 5563**	**60**
1	5651	2.33	0960	1.90	4691	4.25	5309	59
2	5791	2.33	0846	1.90	4946	4.23	5054	58
3	5931	2.33	0732	1.90	5200	4.23	4800	57
4	6071	2.33	0618	1.90	5454	4.23	4546	56
5	**9.82 6211**	2.33	**9.87 0504**	1.90	**9.95 5708**	4.22	**10.04 4292**	**55**
6	6351	2.33	0390	1.90	5961	4.23	4039	54
7	6491	2.33	0276	1.92	6215	4.23	3785	53
8	6631	2.32	0161	1.90	6469	4.23	3531	52
9	6770	2.33	.87 0047	1.90	6723	4.23	3277	51
10	**9.82 6910**	2.32	**9.86 9933**	1.92	**9.95 6977**	4.23	**10.04 3023**	**50**
11	7049	2.33	9818	1.90	7231	4.23	2769	49
12	7189	2.32	9704	1.92	7485	4.23	2515	48
13	7328	2.32	9589	1.92	7739	4.23	2261	47
14	7467	2.32	9474	1.90	7993	4.23	2007	46
15	**9.82 7606**	2.32	**9.86 9360**	1.92	**9.95 8247**	4.22	**10.04 1753**	**45**
16	7745	2.32	9245	1.92	8500	4.23	1500	44
17	7884	2.32	9130	1.92	8754	4.23	1246	43
18	8023	2.32	9015	1.92	9008	4.23	0992	42
19	8162	2.32	8900	1.92	9262	4.23	0738	41
20	**9.82 8301**	2.30	**9.86 8785**	1.92	**9.95 9516**	4.22	**10.04 0484**	**40**
21	8439	2.32	8670	1.92	.95 9769	4.23	.04 0231	39
22	8578	2.30	8555	1.92	.96 0023	4.23	.03 9977	38
23	8716	2.32	8440	1.93	0277	4.22	9723	37
24	8855	2.30	8324	1.92	0530	4.23	9470	36
25	**9.82 8993**	2.30	**9.86 8209**	1.93	**9.96 0784**	4.23	**10.03 9216**	**35**
26	9131	2.30	8093	1.92	1038	4.23	8962	34
27	9269	2.30	7978	1.93	1292	4.22	8708	33
28	9407	2.30	7862	1.92	1545	4.23	8455	32
29	9545	2.30	7747	1.93	1799	4.22	8201	31
30	**9.82 9683**	2.30	**9.86 7631**	1.93	**9.96 2052**	4.23	**10.03 7948**	**30**
31	9821	2.30	7515	1.93	2306	4.23	7694	29
32	.82 9959	2.30	7399	1.93	2560	4.22	7440	28
33	.83 0097	2.28	7283	1.93	2813	4.23	7187	27
34	0234	2.30	7167	1.93	3067	4.22	6933	26
35	**9.83 0372**	2.28	**9.86 7051**	1.93	**9.96 3320**	4.23	**10.03 6680**	**25**
36	0509	2.28	6935	1.93	3574	4.23	6426	24
37	0646	2.30	6819	1.93	3828	4.22	6172	23
38	0784	2.28	6703	1.95	4081	4.23	5919	22
39	0921	2.28	6586	1.93	4335	4.22	5665	21
40	**9.83 1058**	2.28	**9.86 6470**	1.95	**9.96 4588**	4.23	**10.03 5412**	**20**
41	1195	2.28	6353	1.93	4842	4.22	5158	19
42	1332	2.28	6237	1.95	5095	4.23	4905	18
43	1469	2.28	6120	1.93	5349	4.22	4651	17
44	1606	2.27	6004	1.95	5602	4.22	4398	16
45	**9.83 1742**	2.28	**9.86 5887**	1.95	**9.96 5855**	4.23	**10.03 4145**	**15**
46	1879	2.27	5770	1.95	6109	4.22	3891	14
47	2015	2.28	5653	1.95	6362	4.23	3638	13
48	2152	2.27	5536	1.95	6616	4.22	3384	12
49	2288	2.28	5419	1.95	6869	4.23	3131	11
50	**9.83 2425**	2.27	**9.86 5302**	1.95	**9.96 7123**	4.22	**10.03 2877**	**10**
51	2561	2.27	5185	1.95	7376	4.22	2624	9
52	2697	2.27	5068	1.97	7629	4.23	2371	8
53	2833	2.27	4950	1.95	7883	4.22	2117	7
54	2969	2.27	4833	1.95	8136	4.22	1864	6
55	**9.83 3105**	2.27	**9.86 4716**	1.97	**9.96 8389**	4.23	**10.03 1611**	**5**
56	3241	2.27	4598	1.95	8643	4.22	1357	4
57	3377	2.25	4481	1.97	8896	4.22	1104	3
58	3512	2.27	4363	1.97	9149	4.23	0851	2
59	3648	2.25	4245	1.97	9403	4.22	0597	1
60	**9.83 3783**		**9.86 4127**		**9.96 9656**		**10.03 0344**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

132° 47°

43° 136°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.83 3783**	2.27	**9.86 4127**	1.95	**9.96 9656**	4.22	**10.03 0344**	**60**
1	3919	2.25	4010	1.97	.96 9909	4.22	.03 0091	59
2	4054	2.25	3892	1.97	.97 0162	4.23	.02 9838	58
3	4189	2.27	3774	1.97	0416	4.22	9584	57
4	4325	2.25	3656	1.97	0669	4.22	9331	56
5	**9.83 4460**	2.25	**9.86 3538**	1.98	**9.97 0922**	4.22	**10.02 9078**	**55**
6	4595	2.25	3419	1.97	1175	4.23	8825	54
7	4730	2.25	3301	1.97	1429	4.22	8571	53
8	4865	2.23	3183	1.98	1682	4.22	8318	52
9	4999	2.25	3064	1.97	1935	4.22	8065	51
10	**9.83 5134**	2.25	**9.86 2946**	1.98	**9.97 2188**	4.22	**10.02 7812**	**50**
11	5269	2.23	2827	1.97	2441	4.23	7559	49
12	5403	2.25	2709	1.98	2695	4.22	7305	48
13	5538	2.23	2590	1.98	2948	4.22	7052	47
14	5672	2.25	2471	1.97	3201	4.22	6799	46
15	**9.83 5807**	2.23	**9.86 2353**	1.98	**9.97 3454**	4.22	**10.02 6546**	**45**
16	5941	2.23	2234	1.98	3707	4.22	6293	44
17	6075	2.23	2115	1.98	3960	4.22	6040	43
18	6209	2.23	1996	1.98	4213	4.22	5787	42
19	6343	2.23	1877	1.98	4466	4.23	5534	41
20	**9.83 6477**	2.23	**9.86 1758**	2.00	**9.97 4720**	4.22	**10.02 5280**	**40**
21	6611	2.23	1638	1.98	4973	4.22	5027	39
22	6745	2.22	1519	1.98	5226	4.22	4774	38
23	6878	2.23	1400	2.00	5479	4.22	4521	37
24	7012	2.23	1280	1.98	5732	4.22	4268	36
25	**9.83 7146**	2.22	**9.86 1161**	2.00	**9.97 5985**	4.22	**10.02 4015**	**35**
26	7279	2.22	1041	1.98	6238	4.22	3762	34
27	7412	2.23	0922	2.00	6491	4.22	3509	33
28	7546	2.22	0802	2.00	6744	4.22	3256	32
29	7679	2.22	0682	2.00	6997	4.22	3003	31
30	**9.83 7812**	2.22	**9.86 0562**	2.00	**9.97 7250**	4.22	**10.02 2750**	**30**
31	7945	2.22	0442	2.00	7503	4.22	2497	29
32	8078	2.22	0322	2.00	7756	4.22	2244	28
33	8211	2.22	0202	2.00	8009	4.22	1991	27
34	8344	2.22	.86 0082	2.00	8262	4.22	1738	26
35	**9.83 8477**	2.22	**9.85 9962**	2.00	**9.97 8515**	4.22	**10.02 1485**	**25**
36	8610	2.20	9842	2.02	8768	4.22	1232	24
37	8742	2.22	9721	2.00	9021	4.22	0979	23
38	8875	2.20	9601	2.02	9274	4.22	0726	22
39	9007	2.22	9480	2.00	9527	4.22	0473	21
40	**9.83 9140**	2.20	**9.85 9360**	2.02	**9.97 9780**	4.22	**10.02 0220**	**20**
41	9272	2.20	9239	2.00	.98 0033	4.22	.01 9967	19
42	9404	2.20	9119	2.02	0286	4.20	9714	18
43	9536	2.20	8998	2.02	0538	4.22	9462	17
44	9668	2.20	8877	2.02	0791	4.22	9209	16
45	**9.83 9800**	2.20	**9.85 8756**	2.02	**9.98 1044**	4.22	**10.01 8956**	**15**
46	.83 9932	2.20	8635	2.02	1297	4.22	8703	14
47	.84 0064	2.20	8514	2.02	1550	4.22	8450	13
48	0196	2.20	8393	2.02	1803	4.22	8197	12
49	0328	2.18	8272	2.02	2056	4.22	7944	11
50	**9.84 0459**	2.20	**9.85 8151**	2.03	**9.98 2309**	4.22	**10.01 7691**	**10**
51	0591	2.18	8029	2.02	2562	4.20	7438	9
52	0722	2.20	7908	2.03	2814	4.22	7186	8
53	0854	2.18	7786	2.02	3067	4.22	6933	7
54	0985	2.18	7665	2.03	3320	4.22	6680	6
55	**9.84 1116**	2.18	**9.85 7543**	2.02	**9.98 3573**	4.22	**10.01 6427**	**5**
56	1247	2.18	7422	2.03	3826	4.22	6174	4
57	1378	2.18	7300	2.03	4079	4.22	5921	3
58	1509	2.18	7178	2.03	4332	4.20	5668	2
59	1640	2.18	7056	2.03	4584	4.22	5416	1
60	**9.84 1771**		**9.85 6934**		**9.98 4837**		**10.01 5163**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

133° 46°

44° 135°

′	Sine.	D.1″.	Cosine.	D.1″.	Tang.	D.1″.	Cotang.	′
0	**9.84 1771**	2.18	**9.85 6934**	2.03	**9.98 4837**	4.22	**10.01 5163**	**60**
1	1902	2.18	6812	2.03	5090	4.22	4910	59
2	2033	2.17	6690	2.03	5343	4.22	4657	58
3	2163	2.18	6568	2.03	5596	4.20	4404	57
4	2294	2.17	6446	2.05	5848	4.22	4152	56
5	**9.84 2424**	2.18	**9.85 6323**	2.03	**9.98 6101**	4.22	**10.01 3899**	**55**
6	2555	2.17	6201	2.05	6354	4.22	3646	54
7	2685	2.17	6078	2.03	6607	4.22	3393	53
8	2815	2.18	5956	2.05	6860	4.20	3140	52
9	2946	2.17	5833	2.03	7112	4.22	2888	51
10	**9.84 3076**	2.17	**9.85 5711**	2.05	**9.98 7365**	4.22	**10.01 2635**	**50**
11	3206	2.17	5588	2.05	7618	4.22	2382	49
12	3336	2.17	5465	2.05	7871	4.20	2129	48
13	3466	2.15	5342	2.05	8123	4.22	1877	47
14	3595	2.17	5219	2.05	8376	4.22	1624	46
15	**9.84 3725**	2.17	**9.85 5096**	2.05	**9.98 8629**	4.22	**10.01 1371**	**45**
16	3855	2.15	4973	2.05	8882	4.20	1118	44
17	3984	2.17	4850	2.05	9134	4.22	0866	43
18	4114	2.15	4727	2.07	9387	4.22	0613	42
19	4243	2.15	4603	2.05	9640	4.22	0360	41
20	**9.84 4372**	2.17	**9.85 4480**	2.07	**9.98 9893**	4.20	**10.01 0107**	**40**
21	4502	2.15	4356	2.05	.99 0145	4.22	.00 9855	39
22	4631	2.15	4233	2.07	0398	4.22	9602	38
23	4760	2.15	4109	2.05	0651	4.20	9849	37
24	4889	2.15	3986	2.07	0903	4.22	9097	36
25	**9.84 5018**	2.15	**9.85 3862**	2.07	**9.99 1156**	4.22	**10.00 8844**	**35**
26	5147	2.15	3738	2.07	1409	4.22	8591	34
27	5276	2.15	3614	2.07	1662	4.20	8338	33
28	5405	2.13	3490	2.07	1914	4.22	8086	32
29	5533	2.15	3366	2.07	2167	4.22	7833	31
30	**9.84 5662**	2.13	**9.85 3242**	2.07	**9.99 2420**	4.20	**10.00 7580**	**30**
31	5790	2.15	3118	2.07	2672	4.22	7328	29
32	5919	2.13	2994	2.08	2925	4.22	7075	28
33	6047	2.13	2869	2.07	3178	4.22	6822	27
34	6175	2.15	2745	2.08	3431	4.20	6569	26
35	**9.84 6304**	2.13	**9.85 2620**	2.07	**9.99 3683**	4.22	**10.00 6317**	**25**
36	6432	2.13	2496	2.08	3936	4.22	6064	24
37	6560	2.13	2371	2.07	4189	4.20	5811	23
38	6688	2.13	2247	2.08	4441	4.22	5559	22
39	6816	2.13	2122	2.08	4694	4.22	5306	21
40	**9.84 6944**	2.12	**9.85 1997**	2.08	**9.99 4947**	4.20	**10.00 5053**	**20**
41	7071	2.13	1872	2.08	5199	4.22	4801	19
42	7199	2.13	1747	2.08	5452	4.22	4548	18
43	7327	2.12	1622	2.08	5705	4.20	4295	17
44	7454	2.13	1497	2.08	5957	4.22	4043	16
45	**9.84 7582**	2.12	**9.85 1372**	2.10	**9.99 6210**	4.22	**10.00 3790**	**15**
46	7709	2.12	1246	2.08	6463	4.20	3537	14
47	7836	2.13	1121	2.08	6715	4.22	3285	13
48	7964	2.12	0996	2.10	6968	4.22	3032	12
49	8091	2.12	0870	2.08	7221	4.20	2779	11
50	**9.84 8218**	2.12	**9.85 0745**	2.10	**9.99 7473**	4.22	**10.00 2527**	**10**
51	8345	2.12	0619	2.10	7726	4.22	2274	9
52	8472	2.12	0493	2.08	7979	4.20	2021	8
53	8599	2.12	0368	2.10	8231	4.22	1769	7
54	8726	2.10	0242	2.10	8484	4.22	1516	6
55	**9.84 8852**	2.12	**9.85 0116**	2.10	**9.99 8737**	4.20	**10.00 1263**	**5**
56	8979	2.12	84 9990	2.10	8989	4.22	1011	4
57	9106	2.10	9864	2.10	9242	4.22	0758	3
58	9232	2.12	9738	2.12	9495	4.20	0505	2
59	9359	2.10	9611	2.10	9.99 9747	4.22	0253	1
60	**9.84 9485**		**9.84 9485**		**10.00 0000**		**10.00 0000**	**0**
′	Cosine.	D.1″.	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

134° 45°

0° TABLE VI.—NATURAL TRIGONOMETRIC FUNCTIONS 179°

′	SINE	COSINE	TAN.	COTAN.	SEC.	COSEC.	′
0	.000000	1	.000000	INFINITE.	1.000000	INFINITE	60
1	0291	1	0291	3437.746674	0000	3437.746819	59
2	0582	1	0582	1718.873191	0000	1718.873482	58
3	0873	1	0873	1145.915299	0000	1145.915736	57
4	1164	.999999	1164	859.436305	0001	859.436887	56
5	.001454	.999999	.001454	687.548869	1.000001	687.549597	55
6	1745	9998	1745	572.957213	0002	572.958086	54
7	2036	9998	2036	491.106003	0002	491.107021	53
8	2327	9997	2327	429.717571	0003	429.718734	52
9	2618	9997	2618	381.970991	0003	381.972300	51
10	.002909	.999996	.002909	343.773707	1.000004	343.775162	50
11	3200	9995	3200	312.521367	0005	312.522967	49
12	3491	9994	3491	286.477734	0006	286.479479	48
13	3782	9993	3782	264.440799	0007	264.442690	47
14	4072	9992	4072	245.551983	0008	245.554020	46
15	.004363	.999990	.004363	229.181664	1.000010	229.183845	45
16	4654	9989	4654	214.857622	0011	214.859949	44
17	4945	9988	4945	202.218750	0012	202.221222	43
18	5236	9986	5236	190.984186	0014	190.986804	42
19	5527	9985	5527	180.932198	0015	180.934962	41
20	.005818	.999983	.005818	171.885399	1.000017	171.888308	40
21	6109	9981	6109	163.700191	0019	163.703245	39
22	6399	9980	6400	156.259084	0020	156.262283	38
23	6690	9978	6691	149.465021	0022	149.468366	37
24	6981	9976	6981	143.237122	0024	143.240612	36
25	.007272	.999974	.007272	137.507447	1.000026	137.511083	35
26	7563	9971	7563	132.218509	0029	132.222290	34
27	7854	9969	7854	127.321336	0031	127 325263	33
28	8145	9967	8145	122.773955	0033	122.778028	32
29	8436	9964	8436	118.540180	0036	118.544398	31
30	.008727	.999962	.008727	114.588650	1.000038	114.593013	30
31	9017	9959	9018	110.892051	0041	110.896560	29
32	9308	9957	9309	107.426484	0043	107.431138	28
33	9599	9954	9600	104.170945	0046	104.175744	27
34	.009890	9951	.009891	101.106902	0049	101.111848	26
35	.010181	.999948	.010181	98.217943	1.000052	98.223033	25
36	0472	9945	0472	95.489475	0055	95.494711	24
37	0763	9942	0763	92.908487	0058	92.913869	23
38	1054	9939	1054	90.463336	0061	90.468863	22
39	1344	9936	1345	88.143572	0064	88.149244	21
40	.011635	.999932	.011636	85.939791	1.000068	85.945609	20
41	1926	9929	1927	83.843507	0071	83.849470	19
42	2217	9925	2218	81.847041	0075	81.853150	18
43	2508	9922	2509	79.943430	0078	79.949684	17
44	2799	9918	2800	78.126342	0082	78.132742	16
45	.013090	.999914	.013091	76.390009	1.000086	76.396554	15
46	3380	9910	3382	74.729165	0090	74.735856	14
47	3671	9907	3673	73.138991	0093	73.145827	13
48	3962	9903	3964	71.615070	0097	71.622052	12
49	4253	9898	4254	70.153346	0102	70.160473	11
50	.014544	.999894	.014545	68.750087	1.000106	68.757360	10
51	4835	9890	4836	67.401854	0110	67.409272	9
52	5126	9886	5127	66.105473	0114	66.113036	8
53	5416	9881	5418	64.858008	0119	64.865716	7
54	5707	9877	5709	63.656741	0123	63.664595	6
55	.015998	.999872	.016000	62.499154	1.000128	62.507153	5
56	6289	9867	6291	61.382905	0133	61.391050	4
57	6580	9863	6582	60.305820	0137	60.314110	3
58	6871	9858	6873	59.265872	0142	59.274308	2
59	7162	9853	7164	58.261174	0147	58.269755	1
60	.017452	.999848	.017455	57.289962	1.000152	57.298688	0
′	COSINE	SINE	COTAN.	TAN.	COSEC.	SEC.	′

90° 89°

1° 178°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.017452	.999848	.017455	57.289962	1.000152	57.298688	60
1	7743	9843	7746	56.350590	0157	56.359462	59
2	8034	9837	8037	55.441517	0163	55.450535	58
3	8325	9832	8328	54.561300	0168	54.570464	57
4	8616	9827	8619	53.708588	0173	53.717896	56
5	.018907	.999821	.018910	52.882109	1.000179	52.891563	55
6	9197	9816	9201	52.080673	0184	52.090272	54
7	9488	9810	9492	51.303157	0190	51.312902	53
8	.019779	9804	.019783	50.548506	0196	50.558396	52
9	.020070	9799	.020074	49.815726	0201	49.825762	51
10	.020361	.999793	.020365	49.103881	1.000207	49.114062	50
11	0652	9787	0656	48.412084	0213	48.422411	49
12	0942	9781	0947	47.739501	0219	47.749974	48
13	1233	9775	1238	47.085343	0226	47.095961	47
14	1524	9768	1529	46.448862	0232	46.459625	46
15	.021815	.999762	.021820	45.829351	1.000238	45.840260	45
16	2106	9756	2111	45.226141	0244	45.237195	44
17	2397	9749	2402	44.638596	0251	44.649795	43
18	2687	9743	2693	44.066113	0257	44.077458	42
19	2978	9736	2984	43.508122	0264	43.519612	41
20	.023269	.999729	.023275	42.964077	1.000271	42.975713	40
21	3560	9722	3566	42.433464	0278	42.445245	39
22	3851	9716	3857	41.915790	0285	41.927717	38
23	4141	9709	4148	41.410588	0292	41.422660	37
24	4432	9701	4439	40.917412	0299	40.929630	36
25	.024723	.999694	.024731	40.435837	1.000306	40.448201	35
26	5014	9687	5022	39.965461	0313	39.977969	34
27	5305	9680	5313	39.505895	0320	39.518549	33
28	5595	9672	5604	39.056771	0328	39.069571	32
29	5886	9665	5895	38.617738	0335	38.630683	31
30	.026177	.999657	.026186	38.188459	1.000343	38.201550	30
31	6468	9650	6477	37.768613	0350	37.781849	29
32	6759	9642	6768	37.357892	0358	37.371273	28
33	7049	9634	7059	36.956001	0366	36.969528	27
34	7340	9626	7350	36.562659	0374	36.576332	26
35	.027631	.999618	.027641	36.177596	1.000382	36.191414	25
36	7922	9610	7933	35.800553	0390	35.814517	24
37	8212	9602	8224	35.431282	0398	35.445391	23
38	8503	9594	8515	35.069546	0406	35.083800	22
39	8794	9585	8806	34.715115	0415	34.729515	21
40	.029085	.999577	.029097	34.367771	1.000423	34.382316	20
41	9375	9568	9388	34.027303	0432	34.041994	19
42	9666	9560	9679	33.693509	0440	33.708345	18
43	.029957	9551	.029970	33.366194	0449	33.381176	17
44	.030248	9542	.030262	33.045173	0458	33.060300	16
45	.030539	.999534	.030553	32.730264	1.000467	32.745537	15
46	0829	9525	0844	32.421295	0476	32.436713	14
47	1120	9516	1135	32.118099	0485	32.133663	13
48	1411	9507	1426	31.820516	0494	31.836225	12
49	1702	9497	1717	31.528392	0503	31.544246	11
50	.031992	.999488	.032009	31.241577	1.000512	31.257577	10
51	2283	9479	2300	30.959928	0522	30.976074	9
52	2574	9469	2591	30.683307	0531	30.699598	8
53	2864	9460	2882	30.411580	0540	30.428017	7
54	3155	9450	3173	30.144619	0550	30.161201	6
55	.033446	.999441	.033465	29.882299	1.000560	29.899026	5
56	3737	9431	3756	29.624499	0570	29.641373	4
57	4027	9421	4047	29.371106	0579	29.388124	3
58	4318	9411	4338	29.122005	0589	29.139169	2
59	4609	9401	4630	28.877089	0599	28.894398	1
60	.034899	.999391	.034921	28.636253	1.000610	28.653708	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

91° 88°

2° 177°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.034899	.999391	.034921	28.636253	1.000610	28.653708	60
1	5190	9381	5212	399397	0620	28.416997	59
2	5481	9370	5503	28.166422	0630	28.184168	58
3	5772	9360	5795	27.937233	0640	27.955125	57
4	6062	9350	6086	711740	0651	.729777	56
5	.036353	.999339	.036377	27.489853	1.000661	27.508035	55
6	6644	9328	6668	.271486	0672	.289814	54
7	6934	9318	6960	27.056557	0683	27.075030	53
8	7225	9307	7251	26.844984	0694	26.863603	52
9	7516	9296	7542	.636690	0704	.655455	51
10	.037806	.999285	.037834	26.431600	1.000715	26.450510	50
11	8097	9274	8125	.229638	0726	.248694	49
12	8388	9263	8416	26.030736	0738	26.049937	48
13	8678	9252	8707	25.834823	0749	25.854169	47
14	8969	9240	8999	.641832	0760	.661324	46
15	.039260	.999229	.039290	25.451700	1.000772	25.471337	45
16	9550	9218	9581	.264361	0783	.284144	44
17	.039841	9206	.039873	25.079757	0795	25.099685	43
18	.040132	9194	.040164	24.897826	0806	24.917900	42
19	0422	9183	0456	.718512	0818	.738731	41
20	.040713	.999171	.040747	24.541758	1.000830	24.562123	40
21	1004	9159	1038	.367509	0842	388020	39
22	1294	9147	1330	.195714	0854	.216370	38
23	1585	9135	1621	24.026320	0866	24.047121	37
24	1876	9123	1912	23.859277	0878	23.880224	36
25	.042166	.999111	.042204	23.694537	1.000890	23.715630	35
26	2457	9098	2495	.532052	0903	.553291	34
27	2748	9086	2787	.371777	0915	.393161	33
28	3038	9073	3078	.213666	0927	.235196	32
29	3329	9061	3370	23.057677	0940	23.079351	31
30	.043619	.999048	.043661	22.903766	1.000953	22.925586	30
31	3910	9035	3952	.751892	0965	.773857	29
32	4201	9023	4244	.602015	0978	.624126	28
33	4491	9010	4535	.454096	0991	.476353	27
34	4782	8997	4827	.308097	1004	.330499	26
35	.045072	.998984	.045118	22.163980	1.001017	22.186528	25
36	5363	8971	5410	22.021710	1030	22.044403	24
37	5654	8957	5701	21.881251	1044	21.904090	23
38	5944	8944	5993	.742569	1057	.765553	22
39	6235	8931	6284	.605630	1071	.628759	21
40	.046525	.998917	.046576	21.470401	1.001084	21.493676	20
41	6816	8904	6867	.336851	1098	.360272	19
42	7106	8890	7159	.204949	1111	.228515	18
43	7397	8876	7450	21.074664	1125	21.098376	17
44	7688	8862	7742	20.945966	1139	20.969824	16
45	.047978	.998848	.048033	20.818828	1.001153	20.842830	15
46	8269	8834	8325	.693220	1167	.717368	14
47	8559	8820	8617	.569115	1181	.593409	13
48	8850	8806	8908	.446486	1195	.470926	12
49	9140	8792	9200	.325308	1210	.349893	11
50	.049431	.998778	.049491	20.205553	1.001224	20.230284	10
51	.049721	8763	.049783	20.087199	1238	20.112075	9
52	.050012	8749	.050075	19.970219	1253	19.995241	8
53	0302	8734	0366	.854591	1268	.879758	7
54	0593	8719	0658	.740291	1282	.765604	6
55	.050883	.998705	.050949	19.627296	1.001297	19.652754	5
56	1174	8690	1241	.515584	1312	.541187	4
57	1464	8675	1533	.405133	1327	.430882	3
58	1755	8660	1824	.295922	1342	.321816	2
59	2045	8645	2116	.187930	1357	.213970	1
60	.052336	.998630	.052408	19.081137	1.001372	19.107323	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

92° 87°

3° 176°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.052336	.998630	.052408	19.081137	1.001372	19.107323	60
1	2626	8614	2699	18.975523	1388	19.001854	59
2	2917	8599	2991	.871068	1403	18.897545	58
3	3207	8583	3283	.767754	1419	.794377	57
4	3498	8568	3575	.665562	1434	.692330	56
5	.053788	.998552	.053866	18.564473	1.001450	18.591387	55
6	4079	8537	4158	.464471	1465	.491530	54
7	4369	8521	4450	.365537	1481	.392742	53
8	4660	8505	4742	.267654	1497	.295005	52
9	4950	8489	5033	.170807	1513	.198303	51
10	.055241	.998473	.055325	18.074977	1.001529	18.102619	50
11	5531	8457	5617	17.980150	1545	18.007937	49
12	5822	8441	5909	.886310	1562	17.914243	48
13	6112	8424	6200	.793442	1578	.821520	47
14	6402	8408	6492	.701529	1594	.729753	46
15	.056693	.998392	.056784	17.610559	1.001611	17.638928	45
16	6983	8375	7076	.520516	1628	.549030	44
17	7274	8359	7368	.431385	1644	.460046	43
18	7564	8342	7660	.343155	1661	.371960	42
19	7854	8325	7951	.255810	1678	.284761	41
20	.058145	.998308	.058243	17.169337	1.001695	17.198434	40
21	8435	8291	8535	17.083724	1712	.112966	39
22	8726	8274	8827	16.998957	1729	17.028346	38
23	9016	8257	9119	.915025	1746	16.944559	37
24	9306	8240	9411	.831915	1763	.861594	36
25	.059597	.998223	.059703	16.749614	1.001781	16.779439	35
26	.059887	8205	.059995	.668112	1798	.698082	34
27	.060177	8188	.060287	.587396	1816	.617512	33
28	0468	8170	0579	.507456	1833	.537717	32
29	0758	8153	0871	.428279	1851	.458686	31
30	.061049	.998135	.061163	16.349855	1.001869	16.380408	30
31	1339	8117	1455	.272174	1887	.302873	29
32	1629	8099	1747	.195225	1905	.226069	28
33	1920	8081	2039	.118998	1923	.149987	27
34	2210	8063	2331	16.043482	1941	16.074617	26
35	.062500	.998045	.062623	15.968667	1.001959	15.999948	25
36	2791	8027	2915	.894545	1977	.925971	24
37	3081	8008	3207	.821105	1996	.852676	23
38	3371	7990	3499	.748337	2014	.780054	22
39	3661	7972	3791	.676233	2033	.708096	21
40	.063952	.997953	.064083	15.604784	1.002051	15.636793	20
41	4242	7934	4375	.533981	2070	.566135	19
42	4532	7916	4667	.463814	2089	.496114	18
43	4823	7897	4959	.394276	2108	.426721	17
44	5113	7878	5251	.325358	2127	.357949	16
45	.065403	.997859	.065543	15.257052	1.002146	15.289788	15
46	5693	7840	5836	.189349	2165	.222231	14
47	5984	7821	6128	.122242	2184	.155270	13
48	6274	7801	6420	15.055723	2203	.088896	12
49	6564	7782	6712	14.989784	2223	15.023103	11
50	.066854	.997763	.067004	14.924417	1.002242	14.957882	10
51	7145	7743	7296	.859616	2262	.893226	9
52	7435	7724	7589	.795372	2282	.829128	8
53	7725	7704	7881	.731679	2301	.765580	7
54	8015	7684	8173	.668529	2321	.702576	6
55	.068306	.997664	.068465	14.605916	1.002341	14.640109	5
56	8596	7645	8758	.543833	2361	.578172	4
57	8886	7625	9050	.482273	2381	.516757	3
58	9176	7604	9342	.421230	2401	.455859	2
59	9466	7584	9635	.360696	2422	.395471	1
60	.069756	.997564	.069927	14.300666	1.002442	14.335587	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

93° 86°

4° 175°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.069756	.997564	.069927	14.300666	1.002442	14.335587	60
1	.070047	7544	.070219	.241134	2462	.276200	59
2	0337	7523	0511	.182092	2483	.217304	58
3	0627	7503	0804	.123536	2503	.158894	57
4	0917	7482	1096	.065459	2524	.100963	56
5	.071207	.997462	.071389	14.007856	1.002545	14.043504	55
6	1497	7441	1681	13.950719	2566	13.986514	54
7	1788	7420	1973	.894045	2587	.929985	53
8	2078	7399	2266	.837827	2608	.873913	52
9	2368	7378	2558	.782060	2629	.818291	51
10	.072658	.997357	.072851	13.726738	1.002650	13.763115	50
11	2948	7336	3143	.671856	2671	.708379	49
12	3238	7314	3435	.617409	2693	.654077	48
13	3528	7293	3728	.563391	2714	.600205	47
14	3818	7272	4020	.509799	2736	.546758	46
15	.074108	.997250	.074313	13.456625	1.002757	13.493731	45
16	4399	7229	4605	.403867	2779	.441118	44
17	4689	7207	4898	.351518	2801	.388914	43
18	4979	7185	5190	.299574	2823	.337116	42
19	5269	7163	5483	.248031	2845	.285719	41
20	.075559	.997141	.075775	13.196883	1.002867	13.234717	40
21	5849	7119	6068	.146127	2889	.184106	39
22	6139	7097	6361	.095757	2911	.133882	38
23	6429	7075	6653	13.045769	2934	.084040	37
24	6719	7053	6946	12.996160	2956	13.034576	36
25	.077009	.997030	.077238	12.946924	1.002978	12.985486	35
26	7299	7008	7531	.898058	3001	.936765	34
27	7589	6985	7824	.849557	3024	.888410	33
28	7879	6963	8116	.801417	3046	.840416	32
29	8169	6940	8409	.753634	3069	.792779	31
30	.078459	.996917	.078702	12.706205	1.003092	12.745495	30
31	8749	6894	8994	.659125	3115	.698560	29
32	9039	6872	9287	.612390	3138	.651971	28
33	9329	6848	9580	.565997	3161	.605724	27
34	9619	6825	.079873	.519942	3185	.559815	26
35	.079909	.996802	.080165	12.474221	1.003208	12.514240	25
36	.080199	6779	0458	.428831	3232	.468995	24
37	0489	6756	0751	.383768	3255	.424078	23
38	0779	6732	1044	.339028	3279	.379484	22
39	1069	6709	1336	.294609	3302	.335210	21
40	.081359	.996685	.081629	12.250505	1.003326	12.291252	20
41	1649	6661	1922	.206716	3350	.247608	19
42	1939	6637	2215	.163236	3374	.204274	18
43	2228	6614	2508	.120062	3398	.161246	17
44	2518	6590	2801	.077192	3422	.118522	16
45	.082808	.996566	.083094	12.034622	1.003446	12.076098	15
46	3098	6541	3386	11.992349	3471	12.033970	14
47	3388	6517	3679	.950371	3495	11.992137	13
48	3678	6493	3972	.908682	3519	.950595	12
49	3968	6468	4265	.867282	3544	.909340	11
50	.084258	.996444	.084558	11.826167	1.003569	11.868370	10
51	4547	6419	4851	.785333	3593	.827683	9
52	4837	6395	5144	.744779	3618	.787274	8
53	5127	6370	5437	.704500	3643	.747141	7
54	5417	6345	5730	.664495	3668	.707282	6
55	.085707	.996320	.086023	11.624761	1.003693	11.667693	5
56	5997	6295	6316	.585294	3718	.628372	4
57	6286	6270	6609	.546093	3744	.589316	3
58	6576	6245	6902	.507154	3769	.550523	2
59	6866	6220	7196	.468474	3794	.511990	1
60	.087156	.996195	.087489	11.430052	1.003820	11.473713	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

94° 85°

5° 174°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.087156	.996195	.087489	11.430052	1.003820	11.473713	60
1	7446	6169	7782	.391885	3845	.435692	59
2	7735	6144	8075	.353970	3871	.397922	58
3	8025	6118	8368	.316304	3897	.360402	57
4	8315	6093	8661	.278885	3923	.323129	56
5	.088605	.996067	.088954	11.241712	1.003949	11.286101	55
6	8894	6041	9248	.204780	3975	.249316	54
7	9184	6015	9541	.168089	4001	.212770	53
8	9474	5989	.089834	.131635	4027	.176462	52
9	.089763	5963	.090127	.095416	4053	.140389	51
10	.090053	.995937	.090421	11.059431	1.004080	11.104549	50
11	0343	5911	0714	11.023676	4106	.068940	49
12	0633	5884	1007	10.988150	4133	11.033560	48
13	0922	5858	1300	.952850	4159	10.998406	47
14	1212	5832	1594	.917775	4186	.963476	46
15	.091502	.995805	.091887	10.882921	1.004213	10.928768	45
16	1791	5778	2180	.848288	4240	.894281	44
17	2081	5752	2474	.813872	4267	.860011	43
18	2371	5725	2767	.779673	4294	.825957	42
19	2660	5698	3061	.745687	4321	.792117	41
20	.092950	.995671	.093354	10.711913	1.004348	10.758488	40
21	3239	5644	3647	.678348	4375	.725070	39
22	3529	5617	3941	.644992	4403	.691859	38
23	3819	5589	4234	.611841	4430	.658854	37
24	4108	5562	4528	.578895	4458	.626054	36
25	.094398	.995535	.094821	10.546151	1.004485	10.593455	35
26	4687	5507	5115	.513607	4513	.561057	34
27	4977	5479	5408	.481261	4541	.528857	33
28	5267	5452	5702	.449112	4569	.496854	32
29	5556	5424	5995	.417158	4597	.465046	31
30	.095846	.995396	.096289	10.385397	1.004625	10.433431	30
31	6135	5368	6583	.353827	4653	.402007	29
32	6425	5340	6876	.322447	4682	.370772	28
33	6714	5312	7170	.291255	4710	.339726	27
34	7004	5284	7464	.260249	4738	.308866	26
35	.097293	.995256	.097757	10.229428	1.004767	10.278190	25
36	7583	5227	8051	.198789	4795	.247697	24
37	7872	5199	8345	.168332	4824	.217386	23
38	8162	5170	8638	.138054	4853	.187254	22
39	8451	5142	8932	.107954	4882	.157300	21
40	.098741	.995113	.099226	10.078031	1.004911	10.127522	20
41	9030	5084	9519	.048283	4940	.097920	19
42	9320	5056	.099813	10.018708	4969	.068491	18
43	9609	5027	.100107	9.989305	4998	.039234	17
44	.099899	4998	0401	.960072	5028	10.010147	16
45	.100188	.994969	.100695	9.931009	1.005057	9.981229	15
46	0477	4939	0989	.902113	5086	.952479	14
47	0767	4910	1282	.873382	5116	.923894	13
48	1056	4881	1576	.844817	5146	.895474	12
49	1346	4851	1870	.816414	5175	.867218	11
50	.101635	.994822	.102164	9.788173	1.005205	9.839123	10
51	1924	4792	2458	.760093	5235	.811188	9
52	2214	4762	2752	.732171	5265	.783412	8
53	2503	4733	3046	.704407	5295	.755794	7
54	2793	4703	3340	.676800	5325	.728333	6
55	.103082	.994673	.103634	9.649347	1.005356	9.701026	5
56	3371	4643	3928	.622049	5386	.673873	4
57	3661	4613	4222	.594902	5416	.646872	3
58	3950	4583	4516	.567907	5447	.620023	2
59	4239	4552	4810	.541061	5478	.593323	1
60	.104528	.994522	.105104	9.514364	1.005508	9.566772	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

95° 84°

6° 173°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.104528	.994522	.105104	9.514364	1.005508	9.566772	60
1	4818	4491	5398	9.487815	5539	40369	59
2	5107	4461	5692	61412	5570	9.514111	58
3	5396	4430	5987	35153	5601	9.487998	57
4	5686	4400	6281	9.409038	5632	62030	56
5	.105975	.994369	.106575	9.383066	1.005663	9.436203	55
6	6264	4338	6869	57236	5694	9.410518	54
7	6553	4307	7163	31545	5726	9.384974	53
8	6843	4276	7458	9.305994	5757	59568	52
9	7132	4245	7752	9.280580	5788	34301	51
10	.107421	.994214	.108046	9.255304	1.005820	9.309170	50
11	7710	4182	8340	30163	5852	9.284175	49
12	7999	4151	8635	9.205156	5883	59314	48
13	8289	4120	8929	9.180284	5915	34588	47
14	8578	4088	9223	55544	5947	9.209993	46
15	.108867	.994056	.109518	9.130935	1.005979	9.185531	45
16	9156	4025	.109812	9.106456	6011	61198	44
17	9445	3993	.110107	9.082107	6043	36995	43
18	.109734	3961	0401	57887	6076	9.112920	42
19	.110023	3929	0695	33793	6108	9.088972	41
20	.110313	.993897	.110990	9.009826	1.006141	9.065151	40
21	0602	3865	1284	8.985984	6173	41455	39
22	0891	3833	1579	62267	6206	9.017884	38
23	1180	3800	1873	38673	6238	8.994435	37
24	1469	3768	2168	8.915201	6271	71110	36
25	.111758	.993735	.112463	8.891850	1.006304	8.947905	35
26	2047	3703	2757	68621	6337	24821	34
27	2336	3670	3052	45510	6370	8.901857	33
28	2625	3638	3346	8.822519	6403	8.879011	32
29	2914	3605	3641	8.799645	6436	56283	31
30	.113203	.993572	.113936	8.776887	1.006470	8.833671	30
31	3492	3539	4230	54246	6503	8.811176	29
32	3781	3506	4525	31720	6537	8.788796	28
33	4070	3473	4820	8.709308	6570	66530	27
34	4359	3439	5114	8.687009	6604	44377	26
35	.114648	.993406	.115409	8.664822	1.006638	8.722336	25
36	4937	3373	5704	42747	6671	8.700407	24
37	5226	3339	5999	8.620783	6705	8.678589	23
38	5515	3306	6294	8.598929	6739	56881	22
39	5804	3272	6588	77184	6773	35281	21
40	.116093	.993238	.116883	8.555547	1.006808	8.613790	20
41	6382	3205	7178	34017	6842	8.592407	19
42	6671	3171	7473	8.512594	6876	71130	18
43	6960	3137	7768	8.491277	6911	49958	17
44	7249	3103	8063	70065	6945	28892	16
45	.117537	.993068	.118358	8.448957	1.006980	8.507930	15
46	7826	3034	8653	27953	7015	8.487072	14
47	8115	3000	8948	8.407052	7049	66316	13
48	8404	2966	9243	8.386252	7084	45663	12
49	8693	2931	9538	65554	7119	25111	11
50	.118982	.992896	.119833	8.344956	1.007154	8.404659	10
51	9270	2862	.120128	24458	7190	8.384306	9
52	9559	2827	0423	8.304059	7225	64053	8
53	.119848	2792	0718	8.283758	7260	43899	7
54	.120137	2757	1013	63555	7295	23841	6
55	.120426	.992722	.121308	8.243448	1.007331	8.303881	5
56	0714	2687	1604	23438	7367	8.284017	4
57	1003	2652	1899	8.203524	7402	64249	3
58	1292	2617	2194	8.183704	7438	44575	2
59	1581	2582	2489	63979	7474	24995	1
60	.121869	.992546	.122785	8.144346	1.007510	8.205509	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

96° 83°

7° 172°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.121869	.992546	.122785	8.144346	1.007510	8.205509	60
1	2158	2511	3080	24807	7546	8.186116	59
2	2447	2475	3375	8.105360	7582	66815	58
3	2735	2439	3670	8.086004	7618	47605	57
4	3024	2404	3966	66739	7654	28486	56
5	.123313	.992368	.124261	8.047565	1.007691	8.109457	55
6	3601	2332	4557	28480	7727	8.090518	54
7	3890	2296	4852	8.009483	7764	71668	53
8	4179	2260	5147	7.990576	7801	52906	52
9	4467	2224	5443	71755	7837	34232	51
10	.124756	.992187	.125738	7.953022	1.007874	8.015645	50
11	5045	2151	6034	34376	7911	7.997144	49
12	5333	2115	6329	7.915815	7948	78730	48
13	5622	2078	6625	7.897340	7985	60400	47
14	5910	2042	6920	78949	8022	42156	46
15	.126199	.992005	.127216	7.860642	1.008059	7.923995	45
16	6488	1968	7512	42119	8097	7.905918	44
17	6776	1931	7807	24279	8134	7.887924	43
18	7065	1894	8103	7.806221	8172	70012	42
19	7353	1857	8399	7.788245	8209	52182	41
20	.127642	.991820	.128694	7.770351	1.008247	7.834433	40
21	7930	1783	8990	52537	8285	7.816766	39
22	8219	1746	9286	34803	8323	7.799178	38
23	8507	1709	9582	7.717149	8361	81670	37
24	8796	1671	.129877	7.699574	8399	64241	36
25	.129084	.991634	.130173	7.682077	1.008437	7.746890	35
26	9373	1596	0469	64658	8475	29618	34
27	9661	1558	0765	47317	8513	7.712423	33
28	.129949	1521	1061	30053	8552	7.695305	32
29	.130238	1483	1357	7.612866	8590	78263	31
30	.130526	.991445	.131652	7.595754	1.008629	7.661298	30
31	0815	1407	1948	78718	8668	44407	29
32	1103	1369	2244	61757	8706	27592	28
33	1391	1331	2540	44870	8745	7.610852	27
34	1680	1292	2836	28057	8784	7.594185	26
35	.131968	.991254	.133132	7.511318	1.008823	7.577592	25
36	2256	1216	3428	7.494651	8862	61071	24
37	2545	1177	3725	78058	8902	44624	23
38	2833	1138	4021	61536	8941	28248	22
39	3121	1100	4317	45086	8980	7.511944	21
40	.133410	.991061	.134613	7.428706	1.009020	7.495711	20
41	3698	1022	4909	7.412398	9059	79548	19
42	3986	0983	5205	7.396160	9099	63456	18
43	4274	0944	5502	79991	9139	47433	17
44	4563	0905	5798	63892	9178	31480	16
45	.134851	.990866	.136094	7.347861	1.009218	7.415596	15
46	5139	0827	6390	31899	9258	7.399780	14
47	5427	0787	6687	16005	9298	84032	13
48	5716	0748	6983	7.300178	9339	68351	12
49	6004	0708	7279	7.284418	9379	52738	11
50	.136292	.990669	.137576	7.268725	1.009419	7.337191	10
51	6580	0629	7872	53099	9460	21710	9
52	6868	0589	8169	37538	9500	7.306295	8
53	7156	0549	8465	22042	9541	7.290946	7
54	7445	0509	8761	7.206612	9581	75662	6
55	.137733	.990469	.139058	7.191246	1.009622	7.260442	5
56	8021	0429	9354	75944	9663	45286	4
57	8309	0389	9651	60706	9704	30194	3
58	8597	0349	.139948	45531	9745	15165	2
59	8885	0309	.140244	30419	9786	7.200200	1
60	.139173	.990268	.140541	7.115370	1.009828	7.185297	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

97° 82°

8° 171°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.139173	.990268	.140541	7.115370	1.009828	7.185297	60
1	9461	0228	0837	7.100383	9869	70456	59
2	.139749	0187	1134	7.085457	9910	55676	58
3	.140037	0146	1431	70593	9952	40959	57
4	0325	0105	1728	55790	1.009993	26302	56
5	.140613	.990065	.142024	7.041048	1.010035	7.111706	55
6	0901	.990024	2321	26366	0077	7.097170	54
7	1189	.989983	2618	7.011744	0119	82694	53
8	1477	9942	2915	6.997182	0161	68278	52
9	1765	9900	3212	82678	0203	53920	51
10	.142053	.989859	.143508	6.968234	1.010245	7.039622	50
11	2341	9818	3805	53847	0287	25382	49
12	2629	9776	4102	39519	0329	7.011200	48
13	2917	9735	4399	25249	0372	6.997076	47
14	3205	9693	4696	6.911036	0414	83009	46
15	.143493	.989651	.144993	6.896880	1.010457	6.968999	45
16	3780	9610	5290	82781	0499	55046	44
17	4068	9568	5587	68738	0542	41150	43
18	4356	9526	5884	54751	0585	27309	42
19	4644	9484	6181	40820	0628	6.913524	41
20	.144932	.989442	.146478	6.826944	1.010671	6.899794	40
21	5220	9399	6776	6.813123	0714	86119	39
22	5507	9357	7073	6.799357	0757	72499	38
23	5795	9315	7370	85645	0801	58934	37
24	6083	9272	7667	71987	0844	45422	36
25	.146371	.989230	.147964	6.758383	1.010887	6.831964	35
26	6659	9187	8262	44832	0931	18560	34
27	6946	9144	8559	31334	0975	6.805208	33
28	7234	9102	8856	17889	1018	6.791909	32
29	7522	9059	9154	6.704497	1062	78663	31
30	.147809	.989016	.149451	6.691156	1.011106	6.765469	30
31	8097	8973	.149748	77868	1150	52327	29
32	8385	8930	.150046	64631	1194	39236	28
33	8672	8886	0343	51445	1238	26196	27
34	8960	8843	0641	38310	1283	13208	26
35	.149248	.988800	.150938	6.625226	1.011327	6.700270	25
36	9535	8756	1236	6.612192	1371	6.687382	24
37	.149823	8713	1533	6.599208	1416	74545	23
38	.150111	8669	1831	86274	1461	61757	22
39	0398	8626	2129	73389	1505	49018	21
40	.150686	.988582	.152426	6.560554	1.011550	6.636329	20
41	0973	8538	2724	47767	1595	23689	19
42	1261	8494	3022	35029	1640	6.611097	18
43	1548	8450	3319	22340	1685	6.598554	17
44	1836	8406	3617	6.509698	1730	86059	16
45	.152123	.988362	.153915	6.497104	1.011776	6.573611	15
46	2411	8317	4213	84558	1821	61211	14
47	2698	8273	4510	72059	1866	48859	13
48	2986	8228	4808	59607	1912	36553	12
49	3273	8184	5106	47202	1957	24294	11
50	.153561	.988139	.155404	6.434843	1.012003	6.512081	10
51	3848	8094	5702	22530	2049	6.499915	9
52	4136	8050	6000	6.410263	2095	87794	8
53	4423	8005	6298	6.398042	2141	75720	7
54	4710	7960	6596	85866	2187	63690	6
55	.154998	.987915	.156894	6.373736	1.012233	6.451706	5
56	5285	7870	7192	61650	2279	39767	4
57	5572	7824	7490	49609	2326	27872	3
58	5860	7779	7788	37613	2372	16022	2
59	6147	7734	8086	25660	2419	6.404215	1
60	.156434	.987688	.158384	6.313752	1.012465	6.392453	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

98° 81°

9° 170°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.156434	.987688	.158384	6.313752	1.012465	6.392453	60
1	6722	7643	8683	6.301887	2512	80735	59
2	7009	7597	8981	6.290065	2559	69060	58
3	7296	7551	9279	78287	2605	57428	57
4	7584	7506	9577	66551	2652	45839	56
5	.157871	.987460	.159876	6.254859	1.012699	6.334292	55
6	8158	7414	.160174	43209	2747	22788	54
7	8445	7368	0472	31601	2794	6.311327	53
8	8732	7322	0771	20035	2841	6.299907	52
9	9020	7275	1069	6.208511	2889	88530	51
10	.159307	.987229	.161368	6.197028	1.012936	6.277193	50
11	9594	7183	1666	85587	2984	65898	49
12	.159881	7136	1965	74186	3031	54645	48
13	.160168	7090	2263	62827	3079	43432	47
14	0455	7043	2562	51508	3127	32259	46
15	.160743	.986996	.162860	6.140230	1.013175	6.221128	45
16	1030	6950	3159	28992	3223	6.210036	44
17	1317	6903	3458	17794	3271	6.198984	43
18	1604	6856	3756	6.106636	3319	87972	42
19	1891	6809	4055	6.095517	3368	77000	41
20	.162178	.986762	.164354	6.084438	1.013416	6.166067	40
21	2465	6714	4652	73398	3465	55174	39
22	2752	6667	4951	62397	3513	44319	38
23	3039	6620	5250	51434	3562	33503	37
24	3326	6572	5549	40510	3611	22725	36
25	.163613	.986525	.165848	6.029625	1.013659	6.111986	35
26	3900	6477	6147	18777	3708	6.101285	34
27	4187	6429	6446	6.007968	3757	6.090622	33
28	4474	6381	6745	5.997196	3807	79996	32
29	4761	6334	7044	86461	3856	69409	31
30	.165048	.986286	.167343	5.975764	1.013905	6.058858	30
31	5334	6238	7642	65104	3954	48345	29
32	5621	6189	7941	54481	4004	37868	28
33	5908	6141	8240	43895	4054	27428	27
34	6195	6093	8539	33346	4103	17025	26
35	.166482	.986045	.168838	5.922832	1.014153	6.006658	25
36	6769	5996	9137	12355	4203	5.996327	24
37	7056	5947	9437	5.901914	4253	86033	23
38	7342	5899	.169736	5.891508	4303	75774	22
39	7629	5850	.170035	81139	4353	65550	21
40	.167916	.985801	.170334	5.870804	1.014403	5.955362	20
41	8203	5752	0634	60505	4453	45210	19
42	8489	5703	0933	50241	4504	35092	18
43	8776	5654	1233	40012	4554	25009	17
44	9063	5605	1532	29817	4605	14961	16
45	.169350	.985556	.171831	5.819657	1.014656	5.904948	15
46	9636	5507	2131	5.809532	4706	5.894969	14
47	.169923	5457	2430	5.799440	4757	85024	13
48	.170209	5408	2730	89383	4808	75113	12
49	0496	5358	3030	79359	4859	65236	11
50	.170783	.985309	.173329	5.769369	1.014910	5.855392	10
51	1069	5259	3629	59412	4962	45582	9
52	1356	5209	3929	49489	5013	35805	8
53	1643	5159	4228	39599	5064	26062	7
54	1929	5109	4528	29742	5116	16351	6
55	.172216	.985059	.174828	5.719917	5167	5.806673	5
56	2502	5009	5127	10126	1.015219	5.797028	4
57	2789	4959	5427	5.700366	5271	87415	3
58	3075	4909	5727	5.690639	5323	77835	2
59	3362	4858	6027	80945	5375	68287	1
60	.173648	.984808	.176327	5.671282	1.015427	5.758770	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

99° 80

10° 169°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.173648	.984808	.176327	5.671282	1.015427	5.758770	60
1	3935	4757	6627	61651	5479	49286	59
2	4221	4707	6927	52052	5531	39833	58
3	4508	4656	7227	42484	5583	30412	57
4	4794	4605	7527	32947	5636	21022	56
5	.175080	.984554	.177827	5.623442	1.015688	5.711664	55
6	5367	4503	8127	13968	5741	5.702336	54
7	5653	4452	8427	5.604525	5793	5.693039	53
8	5939	4401	8727	5.595112	5846	83773	52
9	6226	4350	9028	85730	5899	74538	51
10	.176512	.984298	.179328	5.576379	1.015952	5.665333	50
11	6798	4247	9628	67057	6005	56158	49
12	7085	4196	.179928	57766	6058	47014	48
13	7371	4144	.180229	48505	6111	37899	47
14	7657	4092	0529	39274	6165	28815	46
15	.177944	.984041	.180829	5.530072	1.016218	5.619760	45
16	8230	3989	1130	20900	6272	10735	44
17	8516	3937	1430	11758	6325	5.601739	43
18	8802	3885	1731	5.502645	6379	5.592772	42
19	9088	3833	2031	5.493560	6433	83834	41
20	.179375	.983781	.182332	5.484505	1.016487	5.574926	40
21	9661	3729	2632	75479	6541	66046	39
22	.179947	3676	2933	66481	6595	57195	38
23	.180233	3624	3234	57512	6649	48373	37
24	0519	3571	3534	48572	6703	39579	36
25	.180805	.983519	.183835	5.439659	1.016757	5.530813	35
26	1091	3466	4136	30775	6812	22075	34
27	1377	3414	4437	21919	6866	13366	33
28	1663	3361	4737	13091	6921	5.504684	32
29	1950	3308	5038	5.404290	6975	5.496030	31
30	.182236	.983255	.185339	5.395517	1.017030	5.487404	30
31	2522	3202	5640	86772	7085	78806	29
32	2808	3149	5941	78054	7140	70234	28
33	3094	3096	6242	69363	7195	61690	27
34	3379	3042	6543	60699	7250	53173	26
35	.183665	.982989	.186844	5.352063	1.017306	5.444683	25
36	3951	2935	7145	43453	7361	36220	24
37	4237	2882	7446	34870	7416	27784	23
38	4523	2828	7747	26313	7472	19374	22
39	4809	2774	8048	17783	7527	10990	21
40	.185095	.982721	.188349	5.309279	1.017583	5.402633	20
41	5381	2667	8651	5.300802	7639	5.394303	19
42	5667	2613	8952	5.292350	7695	85998	18
43	5952	2559	9253	83925	7751	77719	17
44	6238	2505	9555	75526	7807	69466	16
45	.186524	.982450	.189856	5.267152	1.017863	5.361239	15
46	6810	2396	.190157	58804	7919	53038	14
47	7096	2342	0459	50481	7976	44862	13
48	7381	2287	0760	42184	8032	36711	12
49	7667	2233	1062	33912	8089	28586	11
50	.187953	.982178	.191363	5.225665	1.018145	5.320486	10
51	8238	2123	1665	17443	8202	12411	9
52	8524	2069	1966	09246	8259	5.304361	8
53	8810	2014	2268	5.201074	8316	5.296335	7
54	9095	1959	2570	5.192926	8373	88335	6
55	.189381	.981904	.192871	5.184804	1.018430	5.280359	5
56	9667	1849	3173	76705	8487	72407	4
57	.189952	1793	3475	68631	8544	64480	3
58	.190238	1738	3777	60581	8602	56577	2
59	0523	1683	4078	52556	8659	48698	1
60	.190809	.981627	.194380	5.144554	1.018717	5.240843	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

100° 79°

11° 168°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.190809	.981627	.194380	5.144554	1.018717	5.240843	60
1	1095	1572	4682	36576	8774	33012	59
2	1380	1516	4984	28622	8832	25205	58
3	1666	1460	5286	20692	8890	17422	57
4	1951	1405	5588	12786	8948	09662	56
5	.192237	.981349	.195890	5.104902	1.019006	5.201925	55
6	2522	1293	6192	5.097043	9064	5.194212	54
7	2807	1237	6494	89206	9122	86523	53
8	3093	1180	6796	81393	9180	78856	52
9	3378	1124	7099	73602	9239	71213	51
10	.193664	.981068	.197401	5.065835	1.019297	5.163592	50
11	3949	1012	7703	58091	9356	55995	49
12	4234	0955	8005	50369	9415	48420	48
13	4520	0899	8308	42670	9473	40868	47
14	4805	0842	8610	34994	9532	33338	46
15	.195090	.980785	.198912	5.027339	1.019591	5.125831	45
16	5376	0728	9215	19708	9650	18346	44
17	5661	0672	9517	12098	9709	10884	43
18	5946	0615	.199820	5.004511	9769	5.103443	42
19	6231	0558	.200122	4.996946	9828	5.096025	41
20	.196517	.980500	.200425	4.989403	1.019887	5.088628	40
21	6802	0443	0727	81881	1.019947	81254	39
22	7087	0386	1030	74382	1.020006	73901	38
23	7372	0329	1333	66904	0066	66570	37
24	7657	0271	1635	59447	0126	59261	36
25	.197942	.980214	.201938	4.952012	1.020186	5.051973	35
26	8228	0156	2241	44599	0246	44706	34
27	8513	0098	2544	37207	0306	37461	33
28	8798	.980041	2847	29836	0366	30237	32
29	9083	.979983	3149	22486	0426	23034	31
30	.199368	.979925	.203452	4.915157	1.020487	5.015852	30
31	9653	9867	3755	07849	0547	08691	29
32	.199938	9809	4058	4.900562	0608	5.001551	28
33	.200223	9750	4361	4.893296	0668	4.994431	27
34	0508	9692	4664	86050	0729	87332	26
35	.200793	.979634	.204967	4.878825	1.020790	4.980254	25
36	1078	9575	5271	71620	0851	73196	24
37	1363	9517	5574	64436	0912	66159	23
38	1648	9458	5877	57272	0973	59142	22
39	1933	9399	6180	50128	1034	52145	21
40	.202218	.979341	.206483	4.843005	1.021095	4.945169	20
41	2502	9282	6787	35901	1157	38212	19
42	2787	9223	7090	28817	1218	31275	18
43	3072	9164	7393	21754	1280	24359	17
44	3357	9105	7697	14710	1341	17462	16
45	.203642	.979045	.208000	4.807685	1.021403	4.910584	15
46	3927	8986	8304	4.800681	1465	4.903727	14
47	4211	8927	8607	4.793696	1527	4.896889	13
48	4496	8867	8911	86730	1589	90070	12
49	4781	8808	9214	79784	1651	83271	11
50	.205065	.978748	.209518	4.772857	1.021713	4.876491	10
51	5350	8689	.209822	65949	1776	69730	9
52	5635	8629	.210126	59060	1838	62988	8
53	5920	8569	0429	52191	1900	56266	7
54	6204	8509	0733	45340	1963	49562	6
55	.206489	.978449	.211037	4.738508	1.022026	4.842877	5
56	6773	8389	1341	31695	2089	36211	4
57	7058	8329	1645	24901	2151	29564	3
58	7343	8268	1949	18126	2214	22936	2
59	7627	8208	2253	11369	2277	16326	1
60	.207912	.978148	.212557	4.704630	1.022341	4.809734	0
′	Cosine	Sine.	Cotan.	Tan.	Cosec.	Sec.	′

101° 78°

12° 167°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.207912	.978148	.212557	4.704630	1.022341	4.809734	60
1	8196	8087	2861	4.697910	2404	4.803161	59
2	8481	8026	3165	91208	2467	4.796607	58
3	8765	7966	3469	84525	2531	90070	57
4	9050	7905	3773	77860	2594	83552	56
5	.209334	.977844	.214077	4.671212	1.022658	4.777052	55
6	9619	7783	4381	64583	2722	70570	54
7	.209903	7722	4686	57972	2785	64106	53
8	.210187	7661	4990	51379	2849	57660	52
9	0472	7600	5294	44803	2913	51231	51
10	.210756	.977539	.215599	4.638246	1.022977	4.744821	50
11	1040	7477	5903	31706	3042	38428	49
12	1325	7416	6208	25183	3106	32052	48
13	1609	7354	6512	18678	3170	25695	47
14	1893	7293	6817	12191	3235	19354	46
15	.212178	.977231	.217121	4.605721	1.023299	4.713031	45
16	2462	7169	7426	4.599268	3364	06726	44
17	2746	7108	7731	92832	3429	4.700437	43
18	3030	7046	8035	86414	3494	4.694166	42
19	3315	6984	8340	80013	3559	87912	41
20	.213599	.976921	.218645	4.573629	1.023624	4.681675	40
21	3883	6859	8950	67261	3689	75455	39
22	4167	6797	9254	60911	3754	69252	38
23	4451	6735	9559	54578	3819	63065	37
24	4735	6672	.219864	48261	3885	56896	36
25	.215019	.976610	.220169	4.541961	1.023950	4.650743	35
26	5303	6547	0474	35677	4016	44606	34
27	5588	6485	0779	29410	4082	38487	33
28	5872	6422	1084	23160	4148	32384	32
29	6156	6359	1389	16926	4214	26297	31
30	.216440	.976296	.221695	4.510709	1.024280	4.620226	30
31	6724	6233	2000	4.504507	4346	14172	29
32	7008	6170	2305	4.498322	4412	08134	28
33	7292	6107	2610	92153	4478	4.602113	27
34	7575	6044	2916	86000	4544	4.596107	26
35	.217859	.975980	.223221	4.479864	1.024611	4.590117	25
36	8143	5917	3526	73743	4678	84144	24
37	8427	5853	3832	67638	4744	78186	23
38	8711	5790	4137	61549	4811	72244	22
39	8995	5726	4443	55476	4878	66318	21
40	.219279	.975662	.224748	4.449418	1.024945	4.560408	20
41	9562	5598	5054	43376	5012	54513	19
42	.219846	5535	5360	37350	5079	48634	18
43	.220130	5471	5665	31339	5146	42771	17
44	0414	5406	5971	25344	5214	36923	16
45	.220697	.975342	.226277	4.419364	1.025281	4.531090	15
46	0981	5278	6583	13400	5349	25273	14
47	1265	5214	6889	07450	5416	19471	13
48	1548	5149	7194	4.401516	5484	13684	12
49	1832	5085	7500	4.395598	5552	07913	11
50	.222116	.975020	.227806	4.389694	1.025620	4.502157	10
51	2399	4956	8112	83805	5688	4.496415	9
52	2683	4891	8418	77932	5756	90689	8
53	2967	4826	8724	72073	5824	84977	7
54	3250	4761	9031	66229	5892	79281	6
55	.223534	.974696	.229337	4.360400	1.025961	4.473599	5
56	3817	4631	9643	54586	6029	67932	4
57	4101	4566	.229949	48787	6098	62280	3
58	4384	4501	.230255	43002	6166	56643	2
59	4668	4435	0562	37232	6235	51020	1
60	.224951	.974370	.230868	4.331476	1.026304	4.445411	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

102° 77°

13° 166°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.224951	.974370	.230868	4.331476	1.026304	4.445411	60
1	5231	4305	1175	25735	6373	39818	59
2	5518	4239	1481	20008	6442	34238	58
3	5801	4173	1788	14295	6511	28673	57
4	6085	4108	2094	08597	6581	23122	56
5	.226368	.974042	.232401	4.302914	1.026650	4.417586	55
6	6651	3976	2707	4.297244	6719	12064	54
7	6935	3910	3014	91589	6789	06556	53
8	7218	3844	3321	85947	6859	4.401062	52
9	7501	3778	3627	80320	6928	4.395582	51
10	.227784	.973712	.233934	4.274707	1.026998	4.390116	50
11	8068	3645	4241	69107	7068	84664	49
12	8351	3579	4548	63522	7138	79226	48
13	8634	3512	4855	57950	7208	73801	47
14	8917	3446	5162	52392	7278	68391	46
15	.229200	.973379	.235469	4.246848	1.027349	4.362994	45
16	9484	3313	5776	41318	7419	57611	44
17	.229767	3246	6083	35801	7490	52242	43
18	.230050	3179	6390	30298	7560	46886	42
19	0333	3112	6697	24808	7631	41544	41
20	.230616	.973045	.237004	4.219332	1.027702	4.336215	40
21	0899	2978	7312	13869	7773	30900	39
22	1182	2911	7619	08420	7844	25598	38
23	1465	2843	7926	4.202983	7915	20309	37
24	1748	2776	8234	4.197561	7986	15034	36
25	.232031	.972708	.238541	4.192151	1.028057	4.309772	35
26	2314	2641	8848	86755	8129	4.304523	34
27	2597	2573	9156	81371	8200	4.299287	33
28	2880	2506	9464	76001	8272	94064	32
29	3163	2438	.239771	70644	8343	88854	31
30	.233445	.972370	.240079	4.165300	1.028415	4.283658	30
31	3728	2302	0386	59969	8487	78474	29
32	4011	2234	0694	54650	8559	73303	28
33	4294	2166	1002	49345	8631	68145	27
34	4577	2098	1310	44052	8703	63000	26
35	.234859	.972029	.241618	4.138772	1.028776	4.257867	25
36	5142	1961	1925	33505	8848	52747	24
37	5425	1893	2233	28250	8920	47640	23
38	5708	1824	2541	23008	8993	42546	22
39	5990	1755	2849	17778	9066	37464	21
40	.236273	.971687	.243157	4.112561	1.029138	4.232394	20
41	6556	1618	3466	07357	9211	27337	19
42	6838	1549	3774	4.102165	9284	22293	18
43	7121	1480	4082	4.096985	9357	17261	17
44	7403	1411	4390	91818	9430	12241	16
45	.237686	.971342	.244698	4.086663	1.029503	4.207233	15
46	7968	1273	5007	81520	9577	4.202238	14
47	8251	1204	5315	76389	9650	4.197255	13
48	8533	1134	5624	71271	9724	92284	12
49	8816	1065	5932	66164	9797	87325	11
50	.239098	.970995	.246241	4.061070	1.029871	4.182378	10
51	9381	0926	6549	55988	1.029945	77444	9
52	9663	0856	6858	50917	1.030019	72521	8
53	.239946	0786	7166	45859	0093	67610	7
54	.240228	0716	7475	40813	0167	62711	6
55	.240510	.970647	.247784	4.035778	1.030241	4.157824	5
56	0793	0577	8092	30755	0315	52949	4
57	1075	0506	8401	25744	0390	48086	3
58	1357	0436	8710	20745	0464	43234	2
59	1640	0366	9019	15757	0539	38394	1
60	.241922	.970296	.249328	4.010781	1.030614	4.133565	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

103° 76°

14° 165°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.241922	.970296	.249328	4.010781	1.030614	4.133565	60
1	2204	0225	9637	05817	0688	28749	59
2	2486	0155	.249946	4.000864	0763	23943	58
3	2769	0084	.250255	3.995922	0838	19150	57
4	3051	.970014	0564	90992	0913	14368	56
5	.243333	.969943	.250873	3.986074	1.030989	4.109597	55
6	3615	9872	1183	81167	1064	04837	54
7	3897	9801	1492	76271	1139	4.100089	53
8	4179	9730	1801	71387	1215	4.095353	52
9	4461	9659	2111	66514	1290	90627	51
10	.244743	.969588	.252420	3.961652	1.031366	4.085913	50
11	5025	9517	2729	56801	1442	81210	49
12	5307	9445	3039	51962	1518	76518	48
13	5589	9374	3348	47133	1594	71837	47
14	5871	9302	3658	42316	1670	67168	46
15	.246153	.969231	.253968	3.937509	1.031746	4.062509	45
16	6435	9159	4277	32714	1822	57862	44
17	6717	9088	4587	27930	1899	53225	43
18	6999	9016	4897	23156	1975	48599	42
19	7281	8944	5207	18394	2052	43984	41
20	.247563	.968872	.255516	3.913642	1.032128	4.039380	40
21	7845	8800	5826	08901	2205	34787	39
22	8126	8728	6136	3.904171	2282	30205	38
23	8408	8655	6446	3.899452	2359	25633	37
24	8690	8583	6756	94743	2436	21072	36
25	.248972	.968511	.257066	3.890045	1.032513	4.016522	35
26	9253	8438	7377	85357	2590	11982	34
27	9535	8366	7687	80681	2668	07453	33
28	.249817	8293	7997	76014	2745	4.002935	32
29	.250098	8220	8307	71358	2823	3.998427	31
30	.250380	.968148	.258618	3.866713	1.032900	3.993929	30
31	0662	8075	8928	62078	2978	89442	29
32	0943	8002	9238	57454	3056	84965	28
33	1225	7929	9549	52810	3134	80499	27
34	1506	7856	.259859	48236	3212	76043	26
35	.251788	.967782	.260170	3.843642	1.033290	3.971597	25
36	2069	7709	0480	39059	3368	67162	24
37	2351	7636	0791	34486	3447	62737	23
38	2632	7562	1102	29923	3525	58322	22
39	2914	7489	1413	25371	3604	53917	21
40	.253195	.967415	.261723	3.820828	1.033682	3.949522	20
41	3477	7342	2034	16296	3761	45138	19
42	3758	7268	2345	11773	3840	40763	18
43	4039	7194	2656	07261	3919	36399	17
44	4321	7120	2967	3.802759	3998	32044	16
45	.254602	.967046	.263278	3.798266	1.034077	3.927700	15
46	4883	6972	3589	93784	4156	23365	14
47	5165	6898	3900	89311	4236	19040	13
48	5446	6823	4211	84848	4315	14725	12
49	5727	6749	4523	80395	4395	10420	11
50	.256008	.966675	.264834	3.775952	1.034474	3.906125	10
51	6289	6600	5145	71518	4554	3.901840	9
52	6571	6526	5457	67095	4634	3.897564	8
53	6852	6451	5768	62681	4714	93298	7
54	7133	6376	6079	58276	4794	89041	6
55	.257414	.966301	.266391	3.753882	1.034874	3.884794	5
56	7695	6226	6702	49496	4954	80557	4
57	7976	6151	7014	45121	5035	76329	3
58	8257	6076	7326	40755	5115	72111	2
59	8538	6001	7637	36398	5196	67903	1
60	.258819	.965926	.267949	3.732051	1.035276	3.863703	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

104° 75°

15° 164°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	
0	.258819	.965926	.267949	3.732051	1.035276	3.863703	60
1	9100	5850	8261	27713	5357	59514	59
2	9381	5775	8573	23385	5438	55333	58
3	9662	5700	8885	19066	5519	51162	57
4	.259943	5624	9197	14756	5600	47001	56
5	.260224	.965548	.269509	3.710456	1.035681	3.842848	55
6	0505	5473	.269821	06165	5762	38705	54
7	0785	5397	.270133	3.701883	5843	34571	53
8	1066	5321	0445	3.697610	5925	30447	52
9	1347	5245	0757	93347	6006	26331	51
10	.261628	.965169	.271069	3.689093	1.036088	3.822225	50
11	1908	5093	1382	84848	6170	18128	49
12	2189	5016	1694	80611	6252	14040	48
13	2470	4940	2006	76384	6334	09961	47
14	2751	4864	2319	72166	6416	05891	46
15	.263031	.964787	.272631	3.667958	1.036498	3.801830	45
16	3312	4711	2944	63758	6580	3.797778	44
17	3592	4634	3256	59566	6662	93735	43
18	3873	4557	3569	55384	6745	89701	42
19	4154	4481	3882	51211	6827	85676	41
20	.264434	.964404	.274194	3.647047	1.036910	3.781660	40
21	4715	4327	4507	42891	6993	77652	39
22	4995	4250	4820	38744	7076	73653	38
23	5276	4173	5133	34606	7159	69664	37
24	5556	4095	5446	30477	7242	65682	36
25	.265837	.964018	.275759	3.626357	1.037325	3.761710	35
26	6117	3941	6072	22245	7408	57746	34
27	6397	3863	6385	18141	7492	53791	33
28	6678	3786	6698	14047	7575	49845	32
29	6958	3708	7011	09961	7659	45907	31
30	.267238	.963630	.277325	3.605884	1.037742	3.741978	30
31	7519	3553	7638	3.601815	7826	38057	29
32	7799	3475	7951	3.597754	7910	34145	28
33	8079	3397	8265	93702	7994	30241	27
34	8359	3319	8578	89659	8078	26346	26
35	.268640	.963241	.278891	3.585624	1.038162	3.722459	25
36	8920	3163	9205	81598	8246	18580	24
37	9200	3084	9519	77579	8331	14711	23
38	9480	3006	.279832	73570	8415	10849	22
39	.269760	2928	.280146	69568	8500	06996	21
40	.270040	.962849	.280460	3.565575	1.038584	3.703151	20
41	0320	2770	0773	61590	8669	3.699314	19
42	0600	2692	1087	57613	8754	95485	18
43	0880	2613	1401	53645	8839	91665	17
44	1160	2534	1715	49685	8924	87853	16
45	.271440	.962455	.282029	3.545733	1.039009	3.684049	15
46	1720	2376	2343	41789	9095	80254	14
47	2000	2297	2657	37853	9180	76466	13
48	2280	2218	2971	33925	9266	72687	12
49	2560	2139	3286	30005	9351	68915	11
50	.272840	.962059	.283600	3.526094	1.039437	3.665152	10
51	3120	1980	3914	22190	9523	61396	9
52	3400	1901	4229	18295	9609	57649	8
53	3679	1821	4543	14407	9695	53910	7
54	3959	1741	4857	10527	9781	50178	6
55	.274239	.961662	.285172	3.506655	1.039867	3.646455	5
56	4519	1582	5487	3.502792	1.039953	42739	4
57	4798	1502	5801	3.498936	1.040040	39031	3
58	5078	1422	6116	95087	0126	35332	2
59	5358	1342	6431	91247	0213	31640	1
60	.275637	.961262	.286745	3.487414	1.040299	3.627955	0
′	Cosine	Sine	Cotan.	Tan.	Cosec	Sec.	′

105° 74°

16° 163°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.275637	.961262	.286745	3.487414	1.040299	3.627955	60
1	5917	1181	7060	83590	0386	24279	59
2	6197	1101	7375	79773	0473	20610	58
3	6476	1021	7690	75963	0560	16949	57
4	6756	0940	8005	72162	0647	13296	56
5	.277035	.960860	.288320	3.468368	1.040735	3.609650	55
6	7315	0779	8635	64581	0822	06012	54
7	7594	0698	8950	60803	0909	3.602382	53
8	7874	0618	9266	57031	0997	3.598759	52
9	8153	0537	9581	53268	1085	95144	51
10	.278432	.960456	289896	3.449512	1.041172	3.591536	50
11	8712	0375	.290211	45764	1260	87936	49
12	8991	0294	0527	42023	1348	84344	48
13	9270	0212	0842	38289	1436	80759	47
14	9550	0131	1158	34563	1524	77181	46
15	.279829	.960050	.291473	3.430845	1.041613	3.573611	45
16	.280108	.959968	1789	27133	1701	70048	44
17	0388	9887	2105	23430	1789	66493	43
18	0667	9805	2420	19733	1878	62945	42
19	0946	9724	2736	16044	1967	59404	41
20	.281225	.959642	.293052	3.412363	1.042055	3.555871	40
21	1504	9560	3368	08688	2144	52345	39
22	1783	9478	3684	05021	2233	48826	38
23	2062	9396	4000	3.401361	2322	45315	37
24	2341	9314	4316	3.397709	2412	41811	36
25	.282620	.959232	.294632	3.394063	1.042501	3.538314	35
26	2900	9150	4948	90425	2590	34824	34
27	3179	9067	5265	86794	2680	31341	33
28	3457	8985	5581	83170	2769	27866	32
29	3736	8902	5897	79553	2859	24398	31
30	.284015	.958820	.296213	3.375943	1.042949	3.520937	30
31	4294	8737	6530	72341	3039	17482	29
32	4573	8654	6846	68745	3129	14035	28
33	4852	8572	7163	65157	3219	10595	27
34	5131	8489	7480	61575	3309	07162	26
35	.285410	.958406	.297796	3.358001	1.043400	3.503737	25
36	5688	8323	8113	54433	3490	3.500318	24
37	5967	8239	8430	50873	3581	3.496906	23
38	6246	8156	8746	47319	3671	93500	22
39	6525	8073	9063	43772	3762	90102	21
40	.286803	.957990	.299380	3.340233	1.043853	3.486711	20
41	7082	7906	.299697	36700	3944	83327	19
42	7361	7822	.300014	33174	4035	79949	18
43	7639	7739	0331	29654	4126	76578	17
44	7918	7655	0649	26142	4217	73215	16
45	.288196	.957571	.300966	3.322636	1.044309	3.469858	15
46	8475	7487	1283	19137	4400	66507	14
47	8753	7404	1600	15645	4492	63164	13
48	9032	7319	1918	12160	4583	59827	12
49	9310	7235	2235	08681	4675	56497	11
50	.289589	.957151	.302553	3.305209	1.044767	3.453173	10
51	.289867	7067	2870	3.301744	4859	49857	9
52	.290145	6983	3188	3.298285	4951	46547	8
53	0424	6898	3506	94833	5043	43243	7
54	0702	6814	3823	91388	5136	39947	6
55	.290981	.956729	.304141	3.287949	1.045228	3.436656	5
56	1259	6644	4459	84516	5321	33373	4
57	1537	6560	4777	81091	5413	30096	3
58	1815	6475	5095	77671	5506	26825	2
59	2094	6390	5413	74259	5599	23561	1
60	.292372	.956305	.305731	3.270853	1.045692	3.420304	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

106° 73°

17° 162°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.292372	.956305	.305731	3.270853	1.045692	3.420304	60
1	2650	6220	6049	67453	5785	17053	59
2	2928	6134	6367	64060	5878	13808	58
3	3206	6049	6685	60673	5971	10570	57
4	3484	5964	7003	57292	6065	07338	56
5	.293762	.955879	.307322	3.253918	1.046158	3.404113	55
6	4040	5793	7640	50551	6252	3.400894	54
7	4318	5707	7959	47190	6345	3.397682	53
8	4596	5622	8277	43835	6439	94475	52
9	4874	5536	8596	40486	6533	91276	51
10	.295152	.955450	.308914	3.237144	1.046627	3.388082	50
11	5430	5364	9233	33808	6721	84895	49
12	5708	5278	9552	30478	6815	81714	48
13	5986	5192	.309870	27155	6910	78539	47
14	6264	5106	.310189	23837	7004	75371	46
15	.296542	.955020	.310508	3.220526	1.047099	3.372208	45
16	6819	4934	0827	17221	7193	69052	44
17	7097	4847	1146	13923	7288	65903	43
18	7375	4761	1465	10630	7383	62759	42
19	7653	4674	1784	07344	7478	59621	41
20	.297930	.954588	.312104	3.204064	1.047573	3.356490	40
21	8208	4501	2423	3.200790	7668	53365	39
22	8486	4414	2742	3.197522	7763	50246	38
23	8763	4327	3062	94260	7859	47132	37
24	9041	4240	3381	91004	7954	44025	36
25	.299318	.954153	.313700	3.187754	1.048050	3.340924	35
26	9596	4066	4020	84510	8145	37829	34
27	.299873	3979	4340	81272	8241	34740	33
28	.300151	3892	4659	78041	8337	31658	32
29	0428	3804	4979	74815	8433	28581	31
30	.300706	.953717	.315299	3.171595	1.048529	3.325510	30
31	0983	3629	5619	68381	8625	22444	29
32	1261	3542	5939	65173	8722	19385	28
33	1538	3454	6258	61971	8818	16332	27
34	1815	3366	6578	58774	8915	13285	26
35	.302093	.953279	.316899	3.155584	1.049011	3.310243	25
36	2370	3191	7219	52399	9108	07208	24
37	2647	3103	7539	49221	9205	04178	23
38	2924	3015	7859	46048	9302	3.301154	22
39	3202	2926	8179	42881	9399	3.298136	21
40	.303479	.952838	.318500	3.139719	1.049496	3.295123	20
41	3756	2750	8820	36564	9593	92117	19
42	4033	2661	9141	33414	9691	89116	18
43	4310	2573	9461	30270	9788	86121	17
44	4587	2484	.319782	27132	9886	83132	16
45	.304864	.952396	.320103	3.123999	1.049984	3.280148	15
46	5141	2307	0423	20872	1.050081	77170	14
47	5418	2218	0744	17751	0179	74198	13
48	5695	2129	1065	14635	0277	71231	12
49	5972	2040	1386	11525	0376	68270	11
50	.306249	.951951	.321707	3.108421	1.050474	3.265315	10
51	6526	1862	2028	05322	0572	62365	9
52	6803	1773	2349	3.102229	0671	59421	8
53	7080	1684	2670	3.099142	0769	56483	7
54	7357	1594	2991	96060	0868	53550	6
55	.307633	.951505	.323312	3.092983	1.050967	3.250622	5
56	7910	1415	3634	89912	1066	47700	4
57	8187	1326	3955	86847	1165	44784	3
58	8464	1236	4277	83787	1264	41873	2
59	8740	1146	4598	80732	1363	38968	1
60	.309017	.951057	.324920	3.077684	1.051462	3.236068	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

107° 72°

18° 161°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.309017	.951057	.324920	3.077684	1.051462	3.236068	60
1	9294	0967	5241	74640	1562	33174	59
2	9570	0877	5563	71602	1661	30285	58
3	.309847	0786	5885	68569	1761	27401	57
4	.310123	0696	6207	65542	1861	24523	56
5	.310400	.950606	.326528	3.062520	1.051960	3.221650	55
6	0676	0516	6850	59504	2060	18783	54
7	0953	0425	7172	56493	2161	15921	53
8	1229	0335	7494	53487	2261	13064	52
9	1506	0244	7817	50487	2361	10213	51
10	.311782	.950154	.328139	3.047492	1.052461	3.207367	50
11	2059	.950063	8461	44502	2562	04527	49
12	2335	.949972	8783	41517	2663	3.201691	48
13	2611	9881	9106	38538	2763	3.198861	47
14	2888	9790	9428	35564	2864	96037	46
15	.313164	.949699	.329751	3.032595	1.052965	3.193217	45
16	3440	9608	.330073	29632	3066	90403	44
17	3716	9517	0396	26674	3167	87594	43
18	3992	9425	0718	23721	3269	84790	42
19	4269	9334	1041	20773	3370	81991	41
20	.314545	.949243	.331364	3.017830	1.053471	3.179198	40
21	4821	9151	1687	14893	3573	76410	39
22	5097	9059	2010	11960	3675	73626	38
23	5373	8968	2333	09033	3777	70848	37
24	5649	8876	2656	06111	3878	68076	36
25	.315925	.948784	.332979	3.003194	1.053981	3.165308	35
26	6201	8692	3302	3.000282	4083	62545	34
27	6477	8600	3625	2.997375	4185	59788	33
28	6753	8508	3949	94473	4287	57035	32
29	7029	8416	4272	91577	4390	54288	31
30	.317305	.948324	.334595	2.988685	1.054492	3.151545	30
31	7580	8231	4919	85798	4595	48808	29
32	7856	8139	5242	82917	4698	46076	28
33	8132	8046	5566	80040	4801	43348	27
34	8408	7954	5890	77168	4904	40626	26
35	.318684	.947861	.336213	2.974302	1.055007	3.137909	25
36	8959	7768	6537	71440	5110	35196	24
37	9235	7676	6861	68583	5213	32489	23
38	9511	7583	7185	65731	5317	29786	22
39	.319786	7490	7509	62884	5420	27089	21
40	.320062	.947397	.337833	2.960042	1.055524	3.124396	20
41	0337	7304	8157	57205	5628	21708	19
42	0613	7210	8481	54373	5732	19025	18
43	0889	7117	8806	51545	5836	16347	17
44	1164	7024	9130	48723	5940	13674	16
45	.321439	.946930	.339454	2.945905	1.056044	3.111006	15
46	1715	6837	.339779	43092	6148	08342	14
47	1990	6743	.340103	40284	6253	05683	13
48	2266	6649	0428	37481	6357	03030	12
49	2541	6555	0752	34682	6462	3.100381	11
50	.322816	.946462	.341077	2.931888	1.056567	3.097736	10
51	3092	6368	1402	29099	6672	95097	9
52	3367	6274	1727	26315	6777	92462	8
53	3642	6180	2052	23536	6882	89832	7
54	3917	6085	2377	20761	6987	87207	6
55	.324193	.945991	.342702	2.917991	1.057092	3.084586	5
56	4468	5897	3027	15226	7198	81970	4
57	4743	5802	3352	12465	7303	79359	3
58	5018	5708	3677	09709	7409	76752	2
59	5293	5613	4002	06958	7515	74151	1
60	.325568	.945519	.344328	2.904211	1.057621	3.071553	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

108° 71°

19° 160°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.325568	.945519	.344328	2.904211	1.057621	3.071553	60
1	5843	5424	4653	2.901469	7727	68961	59
2	6118	5329	4978	2.898731	7833	66373	58
3	6393	5234	5304	95999	7939	63790	57
4	6668	5139	5630	93270	8045	61211	56
5	.326943	.945044	.345955	2.890547	1.058152	3.058637	55
6	7218	4949	6281	87828	8258	56068	54
7	7493	4854	6607	85113	8365	53503	53
8	7768	4758	6933	82403	8472	50942	52
9	8042	4663	7259	79698	8579	48386	51
10	.328317	.944568	.347585	2.876997	1.058686	3.045835	50
11	8592	4472	7911	74301	8793	43288	49
12	8867	4376	8237	71609	8900	40746	48
13	9141	4281	8563	68921	9007	38208	47
14	9416	4185	8889	66239	9115	35675	46
15	.329691	.944089	.349216	2.863560	1.059222	3.033146	45
16	.329965	3993	9542	60886	9330	30622	44
17	.330240	3897	.349868	58217	9438	28102	43
18	0514	3801	.350195	55552	9545	25587	42
19	0789	3705	0522	52891	9653	23076	41
20	.331063	.943609	.350848	2.850235	1.059762	3.020569	40
21	1338	3512	1175	47583	9870	18067	39
22	1612	3416	1502	44936	1.059978	15569	38
23	1887	3319	1829	42293	1.060087	13076	37
24	2161	3223	2156	39654	0195	10587	36
25	.332435	.943126	.352483	2.837020	1.060304	3.008102	35
26	2710	3029	2810	34390	0412	05622	34
27	2984	2932	3137	31764	0521	03146	33
28	3258	2836	3464	29143	0630	3.000675	32
29	3533	2739	3791	26526	0739	2.998207	31
30	.333807	.942641	.354119	2.823913	1.060849	2.995744	30
31	4081	2544	4446	21304	0958	93286	29
32	4355	2447	4773	18700	1067	90831	28
33	4629	2350	5101	16100	1177	88381	27
34	4903	2252	5429	13505	1287	85935	26
35	.335178	.942155	355756	2.810913	1.061396	2.983494	25
36	5452	2057	6084	08326	1506	81056	24
37	5726	1960	6412	05743	1616	78623	23
38	6000	1862	6740	03165	1727	76194	22
39	6274	1764	7068	2.800590	1837	73769	21
40	.336547	.941666	.357396	2.798020	1.061947	2.971349	20
41	6821	1569	7724	95454	2058	68933	19
42	7095	1471	8052	92892	2168	66521	18
43	7369	1372	8380	90334	2279	64113	17
44	7643	1274	8708	87780	2390	61709	16
45	.337917	.941176	.359037	2.785231	1.062501	2.959309	15
46	8190	1078	9365	82685	2612	56914	14
47	8464	0979	.359694	80144	2723	54522	13
48	8738	0881	.360022	77607	2834	52135	12
49	9012	0782	0351	75074	2945	49752	11
50	.339285	.940684	.360679	2.772545	1.063057	2.947372	10
51	9559	0585	1008	70020	3168	44997	9
52	.339832	0486	1337	67499	3280	42627	8
53	.340106	0387	1666	64982	3392	40260	7
54	0380	0288	1995	62470	3504	37897	6
55	.340653	.940189	.362324	2.759961	1.063616	2.935538	5
56	0927	.940090	2653	57456	3728	33183	4
57	1200	.939991	2982	54955	3840	30833	3
58	1473	9891	3312	52459	3953	28486	2
59	1747	9792	3641	49966	4065	26143	1
60	.342020	.939693	.363970	2.747477	1.064178	2.923804	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

109° 70°

20° 159°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.342020	.939693	.363970	2.747477	1.064178	2.923804	60
1	2293	9593	4300	44993	4290	21470	59
2	2567	9493	4629	42512	4403	19139	58
3	2840	9394	4959	40035	4516	16812	57
4	3113	9294	5288	37562	4629	14489	56
5	.343387	.939194	.365618	2.735093	1.064743	2.912170	55
6	3660	9094	5948	32628	4856	09855	54
7	3933	8994	6278	30167	4969	07544	53
8	4206	8894	6608	27710	5083	05237	52
9	4479	8794	6938	25257	5196	02934	51
10	.344752	.938694	.367268	2.722808	1.065310	2.900635	50
11	5025	8593	7598	20362	5424	2.898339	49
12	5298	8493	7928	17920	5538	96048	48
13	5571	8393	8259	15483	5652	93760	47
14	5844	8292	8589	13049	5766	91476	46
15	.346117	.938191	.368919	2.710619	1.065881	2.889196	45
16	6390	8091	9250	08192	5995	86920	44
17	6663	7990	9581	05770	6110	84647	43
18	6936	7889	.369911	03351	6224	82379	42
19	7208	7788	.370242	2.700936	6339	80114	41
20	.347481	.937687	.370573	2.698525	1.066454	2.877853	40
21	7754	7586	0904	96118	6569	75596	39
22	8027	7485	1235	93715	6684	73343	38
23	8299	7383	1566	91315	6799	71093	37
24	8572	7282	1897	88919	6915	68847	36
25	.348845	.937181	.372228	2.686527	1.067030	2.866605	35
26	9117	7079	2559	84138	7146	64367	34
27	9390	6977	2890	81754	7262	62132	33
28	9662	6876	3222	79372	7377	59902	32
29	.349935	6774	3553	76995	7493	57674	31
30	.350207	.936672	.373885	2.674621	1.067609	2.855451	30
31	0480	6570	4216	72252	7726	53231	29
32	0752	6468	4548	69885	7842	51015	28
33	1025	6366	4880	67523	7958	48803	27
34	1297	6264	5211	65164	8075	46594	26
35	.351569	.936162	.375543	2.662809	1.068191	2.844389	25
36	1842	6060	5875	60457	8308	42188	24
37	2114	5957	6207	58109	8425	39990	23
38	2386	5855	6539	55765	8542	37796	22
39	2658	5752	6872	53424	8659	35605	21
40	.352931	.935650	.377204	2.651087	1.068776	2.833419	20
41	3203	5547	7536	48753	8894	31235	19
42	3475	5444	7869	46423	9011	29056	18
43	3747	5341	8201	44097	9129	26880	17
44	4019	5238	8534	41774	9246	24707	16
45	.354291	.935135	.378866	2.639455	1.069364	2.822538	15
46	4563	5032	9199	37139	9482	20373	14
47	4835	4929	9532	34827	9600	18211	13
48	5107	4826	.379864	32519	9718	16053	12
49	5379	4722	.380197	30214	9836	13898	11
50	.355651	.934619	.380530	2.627912	1.069955	2.811747	10
51	5923	4515	0863	25614	1.070073	09599	9
52	6194	4412	1196	23320	0192	07455	8
53	6466	4308	1530	21029	0311	05315	7
54	6738	4204	1863	18741	0429	03178	6
55	.357010	.934101	.382196	2.616457	1.070548	2.801044	5
56	7281	3997	2530	14177	0668	2.798914	4
57	7553	3893	2863	11900	0787	96787	3
58	7825	3789	3197	09626	0906	94664	2
59	8096	3685	3530	07356	1025	92544	1
60	.358368	.933580	.383864	2.605089	1.071145	2.790428	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

110° 69°

21° 158°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	
0	.358368	.933580	.383864	2.605089	1.071145	2.790428	60
1	8640	3476	4198	02826	1265	88315	59
2	8911	3372	4532	2.600566	1384	86206	58
3	9183	3267	4866	2.598309	1504	84100	57
4	9454	3163	5200	96056	1624	81997	56
5	.359725	.933058	.385534	2.593807	1.071744	2.779898	55
6	.359997	2954	5868	91561	1865	77802	54
7	.360268	2849	6202	89318	1985	75710	53
8	0540	2744	6536	87078	2106	73621	52
9	0811	2639	6871	84842	2226	71535	51
10	.361082	.932534	.387205	2.582609	1.072347	2.769453	50
11	1353	2429	7540	80380	2468	67374	49
12	1625	2324	7874	78154	2589	65299	48
13	1896	2219	8209	75931	2710	63227	47
14	2167	2113	8544	73712	2831	61158	46
15	.362438	.932008	.388879	2.571496	1.072952	2.759092	45
16	2709	1902	9214	69283	3074	57030	44
17	2980	1797	9549	67074	3195	54971	43
18	3251	1691	.389884	64867	3317	52916	42
19	3522	1586	.390219	62665	3439	50863	41
20	.363793	.931480	.390554	2.560465	1.073561	2.748814	40
21	4064	1374	0889	58269	3683	46769	39
22	4335	1268	1225	56076	3805	44726	38
23	4606	1162	1560	53886	3927	42687	37
24	4877	1056	1896	51699	4049	40651	36
25	.365148	.930950	.392231	2.549516	1.074172	2.738619	35
26	5418	0843	2567	47336	4295	36589	34
27	5689	0737	2903	45159	4417	34563	33
28	5960	0631	3239	42985	4540	32540	32
29	6231	0524	3574	40815	4663	30520	31
30	.366501	.930418	.393910	2.538648	1.074786	2.728504	30
31	6772	0311	4247	36484	4909	26491	29
32	7042	0204	4583	34323	5033	24480	28
33	7313	.930097	4919	32165	5156	22474	27
34	7584	.929990	5255	30011	5280	20470	26
35	.367854	.929884	.395592	2.527860	1.075403	2.718469	25
36	8125	9776	5928	25712	5527	16472	24
37	8395	9669	6265	23567	5651	14478	23
38	8665	9562	6601	21425	5775	12487	22
39	8936	9455	6938	19286	5899	10499	21
40	.369206	.929348	.397275	2.517151	1.076024	2.708514	20
41	9476	9240	7611	15018	6148	06532	19
42	.369747	9133	7948	12889	6273	04554	18
43	.370017	9025	8285	10763	6397	02578	17
44	0287	8917	8622	08640	6522	2.700606	16
45	.370557	.928810	.398960	2.506520	1.076647	2.698637	15
46	0828	8702	9297	04403	6772	96671	14
47	1098	8594	9634	02289	6897	94708	13
48	1368	8486	.399971	2.500178	7022	92748	12
49	1638	8378	.400309	2.498071	7148	90791	11
50	.371908	.928270	.400646	2.495966	1.077273	2.688837	10
51	2178	8161	0984	93865	7399	86887	9
52	2448	8053	1322	91766	7525	84939	8
53	2718	7945	1660	89671	7650	82995	7
54	2988	7836	1997	87578	7776	81053	6
55	.373258	.927728	.402335	2.485489	1.077902	2.679114	5
56	3528	7619	2673	83402	8029	77179	4
57	3797	7510	3011	81319	8155	75247	3
58	4067	7402	3350	79239	8281	73317	2
59	4337	7293	3688	77161	8408	71391	1
60	.374607	.927184	.404026	2.475087	1.078535	2.669467	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

111° 68°

22° 157°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.374607	.927184	.404026	2.475087	1.078535	2.669467	60
1	4876	7075	4365	73015	8662	67547	59
2	5146	6966	4703	70947	8788	65629	58
3	5416	6857	5042	68882	8916	63715	57
4	5685	6747	5380	66819	9043	61803	56
5	.375955	.926638	.405719	2.464760	1.079170	2.659895	55
6	6224	6529	6058	62703	9297	57989	54
7	6494	6419	6397	60649	9425	56086	53
8	6763	6310	6736	58599	9553	54187	52
9	7033	6200	7075	56551	9680	52290	51
10	.377302	.926090	.407414	2.454506	1.079808	2.650396	50
11	7571	5980	7753	52464	1.079936	48505	49
12	7841	5871	8092	50425	1.080065	46617	48
13	8110	5761	8432	48389	0193	44732	47
14	8379	5651	8771	46356	0321	42850	46
15	.378649	.925541	.409111	2.444326	1.080450	2.640971	45
16	8918	5430	9450	42298	0578	39095	44
17	9187	5320	.409790	40274	0707	37221	43
18	9456	5210	.410130	38252	0836	35351	42
19	9725	5099	0470	36233	0965	33483	41
20	.379994	.924989	.410810	2.434217	1.081094	2.631618	40
21	.380263	4878	1150	32204	1223	29756	39
22	0532	4768	1490	30194	1353	27897	38
23	0801	4657	1830	28186	1482	26041	37
24	1070	4546	2170	26182	1612	24187	36
25	.381339	.924435	.412511	2.424180	1.081742	2.622337	35
26	1608	4324	2851	22181	1872	20489	34
27	1877	4213	3192	20185	2002	18644	33
28	2146	4102	3532	18192	2132	16802	32
29	2415	3991	3873	16201	2262	14962	31
30	.382683	.923880	.414214	2.414214	1.082392	2.613126	30
31	2952	3768	4554	12229	2523	11292	29
32	3221	3657	4895	10247	2653	09461	28
33	3490	3545	5236	08267	2784	07633	27
34	3758	3434	5577	06291	2915	05808	26
35	.384027	.923322	.415919	2.404317	1.083046	2.603985	25
36	4295	3210	6260	02346	3177	02165	24
37	4564	3098	6601	2.400377	3308	2.600348	23
38	4832	2986	6943	2.398412	3439	2.598534	22
39	5101	2875	7284	96449	3571	96723	21
40	.385369	.922762	.417626	2.394489	1.083703	2.594914	20
41	5638	2650	7967	92532	3834	93108	19
42	5906	2538	8309	90577	3966	91304	18
43	6174	2426	8651	88625	4098	89504	17
44	6443	2313	8993	86676	4230	87706	16
45	.386711	.922201	.419335	2.384729	1.084362	2.585911	15
46	6979	2088	.419677	82786	4495	84118	14
47	7247	1976	.420019	80844	4627	82328	13
48	7516	1863	0361	78906	4760	80541	12
49	7784	1750	0704	76970	4892	78757	11
50	.388052	.921638	.421046	2.375037	1.085025	2.576975	10
51	8320	1525	1389	73107	5158	75196	9
52	8588	1412	1731	71179	5291	73420	8
53	8856	1299	2074	69254	5424	71646	7
54	9124	1185	2417	67332	5558	69875	6
55	.389392	.921072	.422759	2.365412	1.085691	2.568107	5
56	9660	0959	3102	63495	5825	66341	4
57	.389928	0846	3445	61580	5959	64578	3
58	.390196	0732	3788	59668	6092	62818	2
59	0463	0618	4132	57759	6226	61060	1
60	.390731	.920505	.424475	2.355852	1.086360	2.559305	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

112° 67°

23° 156°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.390731	.920505	.424475	2.355852	1.086360	2.559305	60
1	0999	0391	4818	53948	6495	57552	59
2	1267	0277	5162	52047	6629	55802	58
3	1534	0164	5505	50148	6763	54055	57
4	1802	.920050	5849	48252	6898	52310	56
5	.392070	.919936	.426192	2.346358	1.087033	2.550568	55
6	2337	9821	6536	44467	7167	48828	54
7	2605	9707	6880	42579	7302	47091	53
8	2872	9593	7224	40693	7437	45357	52
9	3140	9479	7568	38809	7573	43625	51
10	.393407	.919364	.427912	2.336929	1.087708	2.541896	50
11	3675	9250	8256	35050	7843	40169	49
12	3942	9135	8601	33175	7979	38445	48
13	4209	9021	8945	31302	8115	36724	47
14	4477	8906	9289	29431	8251	35005	46
15	.394744	.918791	.429634	2.327563	1.088387	2.533288	45
16	5011	8676	.429979	25698	8523	31574	44
17	5278	8561	.430323	23835	8659	29863	43
18	5546	8446	0668	21974	8795	28154	42
19	5813	8331	1013	20116	8932	26448	41
20	.396080	.918216	.431358	2.318261	1.089068	2.524744	40
21	6347	8101	1703	16408	9205	23043	39
22	6614	7986	2048	14557	9342	21344	38
23	6881	7870	2393	12709	9479	19648	37
24	7148	7755	2739	10864	9616	17954	36
25	.397415	.917639	.433084	2.309021	1.089753	2.516262	35
26	7682	7523	3430	07180	1.089890	14574	34
27	7949	7408	3775	05342	1.090028	12887	33
28	8215	7292	4121	03506	0166	11203	32
29	8482	7176	4467	2.301673	0303	09522	31
30	.398749	.917060	.434812	2.299843	1.090441	2.507843	30
31	9016	6944	5158	98014	0579	06166	29
32	9283	6828	5504	96188	0717	04492	28
33	9549	6712	5850	94365	0855	02821	27
34	.399816	6595	6197	92544	0994	2.501151	26
35	.400082	.916479	.436543	2.290726	1.091132	2.499485	25
36	0349	6363	6889	88910	1271	97820	24
37	0616	6246	7236	87096	1410	96159	23
38	0882	6130	7582	85285	1549	94499	22
39	1149	6013	7929	83476	1688	92842	21
40	.401415	.915896	.438276	2.281669	1.091827	2.491187	20
41	1681	5779	8622	79865	1966	89535	19
42	1948	5663	8969	78064	2105	87885	18
43	2214	5546	9316	76264	2245	86238	17
44	2480	5429	.439663	74467	2384	84593	16
45	.402747	.915311	.440011	2.272673	1.092524	2.482950	15
46	3013	5194	0358	70881	2664	81310	14
47	3279	5077	0705	69091	2804	79672	13
48	3545	4960	1053	67304	2944	78037	12
49	3811	4842	1400	65518	3085	76403	11
50	.404078	.914725	.441748	2.263736	1.093225	2.474773	10
51	4344	4607	2095	61955	3366	73144	9
52	4610	4490	2443	60177	3506	71518	8
53	4876	4372	2791	58402	3647	69894	7
54	5142	4254	3139	56628	3788	68273	6
55	.405408	.914136	.443487	2.254857	1.093929	2.466654	5
56	5673	4018	3835	53089	4070	65037	4
57	5939	3900	4183	51322	4212	63423	3
58	6205	3782	4532	49558	4353	61811	2
59	6471	3664	4880	47796	4495	60201	1
60	.406737	.913545	.445229	2.246037	1.094636	2.458593	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

113° 66°

24° 155°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.406737	.913545	.445229	2.246037	1.094636	2.458593	60
1	7002	3427	5577	44280	4778	56988	59
2	7268	3309	5926	42525	4920	55385	58
3	7534	3190	6275	40772	5062	53785	57
4	7799	3072	6624	39022	5204	52186	56
5	.408065	.912953	.446973	2.237274	1.095347	2.450591	55
6	8330	2834	7322	35528	5489	48997	54
7	8596	2715	7671	33785	5632	47405	53
8	8861	2596	8020	32043	5775	45816	52
9	9127	2477	8369	30304	5917	44229	51
10	.409392	.912358	.448719	2.228568	1.096060	2.442645	50
11	9658	2239	9068	26833	6204	41062	49
12	.409923	2120	9418	25101	6347	39482	48
13	.410188	2001	.449768	23371	6490	37904	47
14	0454	1881	.450117	21643	6634	36329	46
15	.410719	.911762	.450467	2.219918	1.096777	2.434756	45
16	0984	1643	0817	18194	6921	33184	44
17	1249	1523	1167	16473	7065	31616	43
18	1514	1403	1517	14754	7209	30049	42
19	1779	1284	1868	13038	7353	28484	41
20	.412045	.911164	.452218	2.211323	1.097498	2.426922	40
21	2310	1044	2568	09611	7642	25362	39
22	2575	0924	2919	07901	7787	23804	38
23	2840	0804	3269	06193	7931	22249	37
24	3104	0684	3620	04488	8076	20695	36
25	.413369	.910563	.453971	2.202784	1.098221	2.419144	35
26	3634	0443	4322	2.201083	8366	17595	34
27	3899	0323	4673	2.199384	8511	16048	33
28	4164	0202	5024	97687	8657	14504	32
29	4429	.910082	5375	95992	8802	12961	31
30	.414693	.909961	.455726	2.194300	1.098948	2.411421	30
31	4958	9841	6078	92609	9094	09883	29
32	5223	9720	6429	90921	9239	08347	28
33	5487	9599	6781	89235	9386	06813	27
34	5752	9478	7132	87551	9532	05282	26
35	.416016	.909357	.457484	2.185869	1.099678	2.403752	25
36	6281	9236	7836	84189	9824	02225	24
37	6545	9115	8188	82512	1.099971	2.400700	23
38	6810	8994	8540	80836	1.100118	2.399176	22
39	7074	8872	8892	79163	0264	97656	21
40	.417338	.908751	.459244	2.177492	1.100411	2.396137	20
41	7603	8630	9596	75823	0558	94620	19
42	7867	8508	.459949	74156	0706	93106	18
43	8131	8387	.460301	72491	0853	91593	17
44	8396	8265	0654	70828	1000	90083	16
45	.418660	.908143	.461006	2.169168	1.101148	2.388575	15
46	8924	8021	1359	67509	1296	87068	14
47	9188	7899	1712	65853	1444	85564	13
48	9452	7777	2065	64198	1592	84063	12
49	9716	7655	2418	62546	1740	82563	11
50	.419980	.907533	.462771	2.160896	1.101888	2.381065	10
51	.420244	7411	3124	59248	2036	79569	9
52	0508	7289	3478	57602	2185	78076	8
53	0772	7166	3831	55958	2334	76584	7
54	1036	7044	4185	54316	2482	75095	6
55	.421300	.906922	.464538	2.152676	1.102631	2.373608	5
56	1563	6799	4892	51038	2780	72122	4
57	1827	6676	5246	49402	2930	70639	3
58	2091	6554	5600	47768	3079	69158	2
59	2355	6431	5954	46137	3228	67679	1
60	.422618	.906308	.466308	2.144507	1.103378	2.366202	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

114° 65°

25° 154°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.422618	.906308	.466308	2.144507	1.103378	2.366202	60
1	2882	6185	6662	42879	3528	64727	59
2	3145	6062	7016	41254	3678	63254	58
3	3409	5939	7371	39630	3828	61783	57
4	3673	5815	7725	38009	3978	60314	56
5	.423936	.905692	.468080	2.136389	1.104128	2.358847	55
6	4199	5569	8434	34771	4278	57382	54
7	4463	5445	8789	33156	4429	55919	53
8	4726	5322	9144	31542	4580	54458	52
9	4990	5198	9499	29931	4730	52999	51
10	.425253	.905075	.469854	2.128321	1.104881	2.351542	50
11	5516	4951	.470209	26714	5032	50088	49
12	5779	4827	0564	25108	5184	48635	48
13	6042	4703	0920	23505	5335	47184	47
14	6306	4579	1275	21903	5486	45735	46
15	.426569	.904455	.471631	2.120303	1.105638	2.344288	45
16	6832	4331	1986	18706	5790	42843	44
17	7095	4207	2342	17110	5942	41400	43
18	7358	4083	2698	15516	6094	39959	42
19	7621	3958	3054	13925	6246	38520	41
20	.427884	.903834	.473410	2.112335	1.106398	2.337083	40
21	8147	3709	3766	10747	6551	35648	39
22	8410	3585	4122	09161	6703	34215	38
23	8672	3460	4478	07577	6856	32784	37
24	8935	3335	4835	05995	7009	31355	36
25	.429198	.903210	.475191	2.104415	1.107162	2.329928	35
26	9461	3086	5548	02837	7315	28502	34
27	9723	2961	5905	2.101261	7468	27079	33
28	.429986	2836	6262	2.099686	7621	25658	32
29	.430249	2710	6619	98114	7775	24238	31
30	.430511	.902585	.476976	2.096544	1.107929	2.322820	30
31	0774	2460	7333	94975	8082	21405	29
32	1036	2335	7690	93408	8236	19991	28
33	1299	2209	8047	91844	8390	18579	27
34	1561	2084	8405	90281	8545	17169	26
35	.431823	.901958	.478762	2.088720	1.108699	2.315761	25
36	2086	1833	9120	87161	8853	14355	24
37	2348	1707	9477	85604	9008	12951	23
38	2610	1581	.479835	84049	9163	11549	22
39	2873	1455	.480193	82495	9318	10149	21
40	.433135	.901329	.480551	2.080944	1.109473	2.308750	20
41	3397	1203	0909	79394	9628	07354	19
42	3659	1077	1267	77847	9783	05959	18
43	3921	0951	1626	76301	1.109938	04566	17
44	4183	0825	1984	74757	1.110094	03175	16
45	.434445	.900698	.482343	2.073215	1.110250	2.301786	15
46	4707	0572	2701	71674	0406	2.300399	14
47	4969	0445	3060	70136	0562	2.299013	13
48	5231	0319	3419	68599	0718	97630	12
49	5493	0192	3778	67065	0874	96248	11
50	.435755	.900065	.484137	2.065532	1.111030	2.294869	10
51	6017	.899939	4496	64001	1187	93491	9
52	6278	9812	4855	62472	1344	92115	8
53	6540	9685	5214	60944	1500	90740	7
54	6802	9558	5574	59419	1657	89368	6
55	.437063	.899431	.485933	2.057895	1.111814	2.287997	5
56	7325	9304	6293	56373	1972	86629	4
57	7587	9176	6653	54853	2129	85262	3
58	7848	9049	7013	53335	2287	83897	2
59	8110	8922	7373	51818	2444	82533	1
60	.438371	.898794	.487733	2.050304	1.112602	2.281172	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

115° 64°

26° 153°

′	Sine	Cosine	Tan.	Cot.	Sec.	Cosec.	′
0	.438371	.898794	.487733	2.050304	1.112602	2.281172	60
1	8633	8666	8093	48791	2760	79812	59
2	8894	8539	8453	47280	2918	78455	58
3	9155	8411	8813	45771	3076	77099	57
4	9417	8283	9174	44263	3234	75744	56
5	.439678	.898156	.489534	2.042758	1.113393	2.274392	55
6	.439939	8028	.489895	41254	3552	73042	54
7	.440200	7900	.490256	39752	3710	71693	53
8	0462	7771	0617	38252	3869	70346	52
9	0723	7643	0978	36753	4028	69001	51
10	.440984	.897515	.491339	2.035256	1.114187	2.267657	50
11	1245	7387	1700	33762	4347	66315	49
12	1506	7258	2061	32268	4506	64976	48
13	1767	7130	2422	30777	4666	63638	47
14	2028	7001	2784	29287	4826	62301	46
15	.442289	.896873	.493145	2.027799	1.114985	2.260967	45
16	2550	6744	3507	26313	5145	59634	44
17	2810	6615	3869	24829	5306	58303	43
18	3071	6486	4231	23346	5466	56974	42
19	3332	6358	4593	21865	5626	55646	41
20	.443593	.896229	.494955	2.020386	1.115787	2.254320	40
21	3853	6099	5317	18909	5948	52996	39
22	4114	5970	5679	17433	6108	51674	38
23	4375	5841	6042	15959	6269	50354	37
24	4635	5712	6404	14487	6431	49035	36
25	.444896	.895582	.496767	2.013016	1.116592	2.247718	35
26	5156	5453	7130	11548	6753	46402	34
27	5417	5323	7492	10081	6915	45089	33
28	5677	5194	7855	08615	7077	43777	32
29	5937	5064	8218	07152	7238	42467	31
30	.446198	.894934	.498582	2.005690	1.117400	2.241158	30
31	6458	4805	8945	04229	7563	39852	29
32	6718	4675	9308	02771	7725	38547	28
33	6979	4545	.499672	2.001314	7887	37243	27
34	7239	4415	.500035	1.999859	8050	35942	26
35	.447499	.894284	.500399	1.998406	1.118212	2.234642	25
36	7759	4154	0763	96954	8375	33344	24
37	8019	4024	1127	95504	8538	32047	23
38	8279	3894	1491	94055	8701	30753	22
39	8539	3763	1855	92609	8865	29459	21
40	.448799	.893633	.502219	1.991164	1.119028	2.228168	20
41	9059	3502	2583	89720	9192	26878	19
42	9319	3371	2948	88279	9355	25590	18
43	9579	3241	3312	86839	9519	24304	17
44	.449839	3110	3677	85400	9683	23019	16
45	.450098	.892979	.504041	1.983964	1.119847	2.221736	15
46	0358	2848	4406	82529	1.120011	20455	14
47	0618	2717	4771	81095	0176	19175	13
48	0878	2586	5136	79664	0340	17897	12
49	1137	2455	5502	78233	0505	16621	11
50	.451397	.892323	.505867	1.976805	1.120670	2.215346	10
51	1656	2192	6232	75378	0835	14073	9
52	1916	2061	6598	73953	1000	12802	8
53	2175	1929	6963	72530	1165	11532	7
54	2435	1798	7329	71108	1331	10264	6
55	.452694	.891666	.507695	1.969687	1.121496	2.208997	5
56	2953	1534	8061	68269	1662	07732	4
57	3213	1402	8427	66852	1828	06469	3
58	3472	1270	8793	65436	1994	05208	2
59	3731	1139	9159	64023	2160	03948	1
60	.453990	.891007	.509525	1.962611	1.122326	2.202689	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

116° 63°

27° 152°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.453990	.891007	.509525	1.962611	1.122326	2.202689	60
1	4250	0874	.509892	61200	2493	01433	59
2	4509	0742	.510258	59791	2659	2.200177	58
3	4768	0610	0625	58384	2826	2.198924	57
4	5027	0478	0992	56978	2993	97672	56
5	.455286	.890345	.511359	1.955574	1.123160	2.196422	55
6	5545	0213	1726	54171	3327	95173	54
7	5804	.890080	2093	52770	3494	93926	53
8	6063	.889948	2460	51371	3662	92681	52
9	6322	9815	2828	49973	3829	91437	51
10	.456580	.889682	.513195	1.948577	1.123997	2.190195	50
11	6839	9549	3563	47183	4165	88954	49
12	7098	9416	3930	45790	4333	87715	48
13	7357	9283	4298	44398	4501	86478	47
14	7615	9150	4666	43008	4669	85242	46
15	.457874	.889017	.515034	1.941620	1.124838	2.184007	45
16	8133	8884	5402	40233	5006	82775	44
17	8391	8751	5770	38848	5175	81543	43
18	8650	8617	6138	37465	5344	80314	42
19	8908	8484	6507	36082	5513	79086	41
20	.459166	.888350	.516875	1.934702	1.125682	2.177859	40
21	9425	8217	7244	33323	5851	76635	39
22	9683	8083	7613	31946	6021	75411	38
23	.459942	7949	7982	30570	6191	74189	37
24	.460200	7815	8351	29196	6360	72969	36
25	.460458	.887681	.518720	1.927823	1.126530	2.171751	35
26	0716	7548	9089	26452	6700	70534	34
27	0974	7413	9458	25082	6870	69318	33
28	1232	7279	.519828	23714	7041	68104	32
29	1491	7145	.520197	22347	7211	66892	31
30	.461749	.887011	.520567	1.920982	1.127382	2.165681	30
31	2007	6876	0937	19619	7553	64471	29
32	2265	6742	1307	18257	7724	63263	28
33	2523	6608	1677	16896	7895	62057	27
34	2780	6473	2047	15537	8066	60852	26
35	.463038	.886338	.522417	1.914180	1.128237	2.159649	25
36	3296	6204	2787	12824	8409	58447	24
37	3554	6069	3158	11469	8581	57247	23
38	3812	5934	3528	10116	8752	56048	22
39	4069	5799	3899	08765	8924	54851	21
40	.464327	.885664	.524270	1.907415	1.129096	2.153655	20
41	4584	5529	4641	06066	9269	52461	19
42	4842	5394	5012	04719	9441	51268	18
43	5100	5258	5383	03374	9614	50077	17
44	5357	5123	5754	02030	9786	48888	16
45	.465615	.884988	.526125	1.900687	1.129959	2.147699	15
46	5872	4852	6497	1.899346	1.130132	46513	14
47	6129	4717	6868	98007	0305	45327	13
48	6387	4581	7240	96669	0479	44144	12
49	6644	4445	7612	95332	0652	42962	11
50	.466901	.884309	.527984	1.893997	1.130826	2.141781	10
51	7158	4174	8356	92663	1000	40602	9
52	7416	4038	8728	91331	1173	39424	8
53	7673	3902	9100	90001	1348	38247	7
54	7930	3766	9473	88671	1522	37073	6
55	.468187	.883629	.529845	1.887344	1.131696	2.135899	5
56	8444	3493	.530218	86017	1871	34727	4
57	8701	3357	0591	84692	2045	33557	3
58	8958	3221	0963	83369	2220	32388	2
59	9215	3084	1336	82047	2395	31221	1
60	.469472	.882948	.531709	1.880726	1.132570	2.130054	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

117° 62°

28° 151°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.469472	.882948	.531709	1.880726	1.132570	2.130054	60
1	9728	2811	2083	79407	2745	28890	59
2	.469985	2674	2456	78090	2921	27727	58
3	.470242	2538	2829	76774	3096	26565	57
4	0499	2401	3203	75459	3272	25405	56
5	.470755	.882264	.533577	1.874145	1.133448	2.124246	55
6	1012	2127	3950	72834	3624	23089	54
7	1268	1990	4324	71523	3800	21933	53
8	1525	1853	4698	70214	3976	20778	52
9	1782	1715	5072	68906	4153	19625	51
10	.472038	.881578	.535446	1.867600	1.134329	2.118474	50
11	2294	1441	5821	66295	4506	17324	49
12	2551	1303	6195	64992	4683	16175	48
13	2807	1166	6570	63690	4860	15027	47
14	3063	1028	6945	62390	5037	13882	46
15	.473320	.880891	.537319	1.861091	1.135215	2.112737	45
16	3576	0753	7694	59793	5392	11594	44
17	3832	0615	8069	58496	5570	10452	43
18	4088	0477	8445	57202	5748	09312	42
19	4344	0339	8820	55908	5926	08173	41
20	.474600	.880201	.539195	1.854616	1.136104	2.107036	40
21	4856	.880063	9571	53325	6282	05900	39
22	5112	.879925	.539946	52036	6460	04765	38
23	5368	9787	.540322	50748	6639	03632	37
24	5624	9649	0698	49461	6818	02500	36
25	.475880	.879510	.541074	1.848176	1.136997	2.101370	35
26	6136	9372	1450	46892	7176	2.100241	34
27	6392	9233	1826	45610	7355	2.099113	33
28	6647	9095	2203	44329	7534	97987	32
29	6903	8956	2579	43049	7714	96862	31
30	.477159	.878817	.542956	1.841771	1.137893	2.095739	30
31	7414	8678	3332	40494	8073	94616	29
32	7670	8539	3709	39218	8253	93496	28
33	7925	8400	4086	37944	8433	92376	27
34	8181	8261	4463	36671	8613	91258	26
35	.478436	.878122	.544840	1.835400	1.138794	2.090142	25
36	8692	7983	5218	34130	8974	89027	24
37	8947	7844	5595	32861	9155	87913	23
38	9203	7704	5973	31594	9336	86800	22
39	9458	7565	6350	30327	9517	85689	21
40	.479713	.877425	.546728	1.829063	1.139698	2.084579	20
41	.479968	7286	7106	27799	1.139879	83471	19
42	.480223	7146	7484	26537	1.140061	82364	18
43	0479	7006	7862	25277	0242	81258	17
44	0734	6867	8240	24017	0424	80154	16
45	.480989	.876727	.548619	1.822759	1.140606	2.079051	15
46	1244	6587	8997	21503	0788	77949	14
47	1499	6448	9376	20247	0971	76849	13
48	1754	6307	.549755	18993	1153	75750	12
49	2009	6167	.550134	17741	1336	74652	11
50	.482263	.876026	.550513	1.816489	1.141518	2.073556	10
51	2518	5886	0892	15239	1701	72461	9
52	2773	5746	1271	13990	1884	71367	8
53	3028	5605	1650	12743	2067	70275	7
54	3282	5465	2030	11497	2251	69184	6
55	.483537	.875324	.552409	1.810252	1.142434	2.068094	5
56	3792	5183	2789	09009	2618	67006	4
57	4046	5042	3169	07766	2802	65919	3
58	4301	4902	3549	06526	2986	64833	2
59	4555	4761	3929	05286	3170	63748	1
60	.484810	.874620	.554309	1.804048	1.143354	2.062665	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

118° 61°

29° 150°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.484810	.874620	.554309	1.804048	1.143354	2.062665	60
1	5064	4479	4689	02811	3539	61584	59
2	5318	4338	5070	01575	3723	60503	58
3	5573	4196	5450	1.800341	3908	59424	57
4	5827	4055	5831	1.799108	4093	58346	56
5	.486081	.873914	.556212	1.797876	1.144278	2.057269	55
6	6335	3772	6593	96645	4463	56194	54
7	6590	3631	6974	95416	4648	55120	53
8	6844	3489	7355	94188	4834	54048	52
9	7098	3347	7736	92962	5020	52976	51
10	.487352	.873206	.558118	1.791736	1.145205	2.051906	50
11	7606	3064	8499	90512	5391	50837	49
12	7860	2922	8881	89289	5578	49770	48
13	8114	2780	9263	88068	5764	48704	47
14	8367	2638	.559645	86847	5950	47639	46
15	.488621	.872496	.560027	1.785628	1.146137	2.046575	45
16	8875	2354	0409	84411	6324	45513	44
17	9129	2212	0791	83194	6511	44451	43
18	9382	2069	1174	81979	6698	43392	42
19	9636	1927	1556	80765	6885	42333	41
20	.489890	.871784	.561939	1.779552	1.147073	2.041276	40
21	.490143	1642	2322	78341	7260	40220	39
22	0397	1499	2705	77131	7448	39165	38
23	0650	1357	3088	75922	7636	38111	37
24	0904	1214	3471	74714	7824	37059	36
25	.491157	.871071	.563854	1.773508	1.148012	2.036008	35
26	1411	0928	4238	72302	8200	34958	34
27	1664	0785	4621	71098	8389	33910	33
28	1917	0642	5005	69896	8578	32863	32
29	2170	0499	5389	68694	8767	31817	31
30	.492424	.870356	.565773	1.767494	1.148956	2.030772	30
31	2677	0212	6157	66295	9145	29729	29
32	2930	.870069	6541	65097	9334	28686	28
33	3183	.869926	6925	63901	9524	27645	27
34	3436	9782	7310	62705	9713	26606	26
35	.493689	.869639	.567694	1.761511	1.149903	2.025567	25
36	3942	9495	8079	60318	1.150093	24530	24
37	4195	9351	8464	59127	0283	23494	23
38	4448	9207	8849	57936	0473	22459	22
39	4700	9064	9234	56747	0664	21425	21
40	.494953	.868920	.569619	1.755559	1.150854	2.020393	20
41	5206	8776	.570004	54372	1045	19362	19
42	5459	8632	0390	53187	1236	18332	18
43	5711	8487	0776	52002	1427	17303	17
44	5964	8343	1161	50819	1618	16276	16
45	.496217	.868199	.571547	1.749637	1.151810	2.015249	15
46	6469	8054	1933	48456	2001	14224	14
47	6722	7910	2319	47277	2193	13200	13
48	6974	7765	2705	46098	2385	12178	12
49	7226	7621	3092	44921	2577	11156	11
50	.497479	.867476	.573478	1.743745	1.152769	2.010136	10
51	7731	7331	3865	42571	2962	09117	9
52	7983	7187	4252	41397	3154	08099	8
53	8236	7042	4638	40225	3347	07083	7
54	8488	6897	5026	39053	3540	06067	6
55	.498740	.866752	.575413	1.737883	1.153733	2.005053	5
56	8992	6607	5800	36714	3926	04040	4
57	9244	6461	6187	35547	4119	03028	3
58	9496	6316	6575	34380	4313	02018	2
59	.499748	6171	6962	33215	4507	01008	1
60	.500000	.866025	.577350	1.732051	1.154701	2.000000	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

119° 60°

30° 149°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.500000	.866025	.577350	1.732051	1.154701	2.000000	60
1	0252	5880	7738	30888	4895	1.998993	59
2	0504	5734	8126	29726	5089	7987	58
3	0756	5589	8514	28565	5283	6982	57
4	1007	5443	8903	27406	5478	5979	56
5	.501259	.865297	.579291	1.726248	1.155672	1.994976	55
6	1511	5151	.579680	25091	5867	3975	54
7	1762	5006	.580068	23935	6062	2975	53
8	2014	4860	0457	22780	6257	1976	52
9	2266	4713	0846	21626	6452	1.990979	51
10	.502517	.864567	.581235	1.720474	1.156648	1.989982	50
11	2769	4421	1625	19322	6844	8987	49
12	3020	4275	2014	18172	7039	7993	48
13	3271	4128	2403	17023	7235	7000	47
14	3523	3982	2793	15875	7432	6008	46
15	.503774	.863836	.583183	1.714728	1.157628	1.985017	45
16	4025	3689	3573	13583	7824	4028	44
17	4276	3542	3963	12438	8021	3039	43
18	4528	3396	4353	11295	8218	2052	42
19	4779	3249	4743	10153	8415	1066	41
20	.505030	.863102	.585134	1.709012	1.158612	1.980081	40
21	5281	2955	5524	07872	8809	1.979097	39
22	5532	2808	5915	06733	9007	8115	38
23	5783	2661	6306	05595	9204	7133	37
24	6034	2514	6697	04459	9402	6153	36
25	.506285	.862366	.587088	1.703323	1.159600	1.975174	35
26	6535	2219	7479	02189	9798	4195	34
27	6786	2072	7870	1.701056	1.159996	3218	33
28	7037	1924	8262	1.699924	1.160195	2243	32
29	7288	1777	8653	98793	0393	1268	31
30	.507538	.861629	.589045	1.697663	1.160592	1.970294	30
31	7789	1481	9437	96534	0791	1.969322	29
32	8040	1334	.589829	95407	0990	8351	28
33	8290	1186	.590221	94280	1189	7381	27
34	8541	1038	0613	93155	1389	6411	26
35	.508791	.860890	.591006	1.692031	1.161589	1.965444	25
36	9041	0742	1398	90908	1788	4477	24
37	9292	0594	1791	89786	1988	3511	23
38	9542	0446	2184	88665	2188	2546	22
39	.509792	0297	2577	87545	2389	1583	21
40	.510043	.860149	.592970	1.686426	1.162589	1.960621	20
41	0293	.860001	3363	85308	2790	1.959659	19
42	0543	.859852	3757	84192	2990	8699	18
43	0793	9704	4150	83077	3191	7740	17
44	1043	9555	4544	81962	3393	6782	16
45	.511293	.859406	.594937	1.680849	1.163594	1.955825	15
46	1543	9258	5331	79737	3795	4870	14
47	1793	9109	5725	78626	3997	3915	13
48	2043	8960	6120	77516	4199	2961	12
49	2293	8811	6514	76407	4401	2009	11
50	.512543	.858662	.596908	1.675299	1.164603	1.951058	10
51	2792	8513	7303	74192	4805	1.950107	9
52	3042	8364	7698	73086	5008	1.949158	8
53	3292	8214	8093	71982	5210	8210	7
54	3541	8065	8488	70878	5413	7263	6
55	.513791	.857915	.598883	1.669776	1.165616	1.946317	5
56	4040	7766	9278	68674	5819	5373	4
57	4290	7616	.599674	67574	6022	4429	3
58	4539	7467	.600069	66475	6226	3486	2
59	4789	7317	0465	65377	6430	2545	1
60	.515038	.857167	.600861	1.664279	1.166633	1.941604	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

120° 59°

31° 148°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.515038	.857167	.600861	1.664279	1.166633	1.941604	60
1	5287	7017	1257	3183	6837	1.940665	59
2	5537	6868	1653	2088	7042	1.939726	58
3	5786	6718	2049	1.660994	7246	8789	57
4	6035	6567	2445	1.659902	7450	7853	56
5	.516284	.856417	.602842	1.658810	1.167655	1.936918	55
6	6533	6267	3239	7719	7860	5983	54
7	6782	6117	3635	6629	8065	5050	53
8	7031	5966	4032	5541	8270	4119	52
9	7280	5816	4429	4453	8475	3188	51
10	.517529	.855665	.604827	1.653366	1.168681	1.932258	50
11	7778	5515	5224	2281	8887	1329	49
12	8027	5364	5622	1196	9093	1.930401	48
13	8276	5214	6019	1.650113	9299	1.929475	47
14	8525	5063	6417	1.649030	9505	8549	46
15	.518773	.854912	.606815	1.647949	1.169711	1.927624	45
16	9022	4761	7213	6869	1.169918	6701	44
17	9271	4610	7611	5789	1.170124	5778	43
18	9519	4459	8010	4711	0331	4857	42
19	.519768	4308	8408	3634	0538	3937	41
20	.520016	.854156	.608807	1.642558	1.170746	1.923017	40
21	0265	4005	9205	1482	0953	2099	39
22	0513	3854	.609604	1.640408	1161	1182	38
23	0761	3702	.610003	1.639335	1368	1.920265	37
24	1010	3551	0403	8263	1576	1.919350	36
25	.521258	.853399	.610802	1.637192	1.171785	1.918436	35
26	1506	3248	1201	6122	1993	7523	34
27	1754	3096	1601	5053	2201	6611	33
28	2002	2944	2001	3985	2410	5700	32
29	2251	2792	2401	2918	2619	4790	31
30	.522499	.852640	.612801	1.631852	1.172828	1.913881	30
31	2747	2488	3201	1.630787	3037	2973	29
32	2995	2336	3601	1.629723	3246	2066	28
33	3242	2184	4002	8660	3456	1160	27
34	3490	2032	4402	7598	3665	1.910255	26
35	.523738	.851879	.614803	1.626537	1.173875	1.909351	25
36	3986	1727	5204	5477	4085	8448	24
37	4234	1575	5605	4418	4295	7546	23
38	4481	1422	6006	3360	4506	6646	22
39	4729	1269	6408	2303	4716	5746	21
40	.524977	.851117	.616809	1.621247	1.174927	1.904847	20
41	5224	0964	7211	1.620192	5138	3949	19
42	5472	0811	7613	1.619138	5349	3052	18
43	5719	0658	8015	8085	5560	2156	17
44	5967	0505	8417	7033	5772	1262	16
45	.526214	.850352	.618819	1.615982	1.175983	1.900368	15
46	6461	0199	9221	4932	6195	1.899475	14
47	6709	.850046	.619624	3883	6407	8583	13
48	6956	.849893	.620026	2835	6619	7692	12
49	7203	9739	0429	1788	6831	6803	11
50	.527450	.849586	.620832	1.610742	1.177044	1.895914	10
51	7697	9433	1235	1.609697	7257	5026	9
52	7944	9279	1638	8653	7469	4139	8
53	8191	9125	2042	7609	7682	3253	7
54	8438	8972	2445	6567	7896	2368	6
55	.528685	.848818	.622849	1.605526	1.178109	1.891485	5
56	8932	8664	3253	4486	8322	1.890602	4
57	9179	8510	3657	3446	8536	1.889720	3
58	9426	8356	4061	2408	8750	8839	2
59	9673	8202	4465	1371	8964	7959	1
60	.529919	.848048	.624869	1.600335	1.179178	1.887080	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

121° 58°

32° 147°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.529919	.848048	.624869	1.600335	1.179178	1.887080	60
1	.530166	7894	5274	1.599299	9393	6202	59
2	0413	7740	5679	8265	9607	5325	58
3	0659	7585	6083	7231	1.179822	4449	57
4	0906	7431	6488	6199	1.180037	3574	56
5	.531152	.847277	.626894	1.595167	1.180252	1.882700	55
6	1399	7122	7299	4137	0468	1827	54
7	1645	6967	7704	3107	0683	0954	53
8	1891	6813	8110	2078	0899	1.880083	52
9	2138	6658	8516	1051	1115	1.879213	51
10	.532384	.846503	.628921	1.590024	1.181331	1.878344	50
11	2630	6348	9327	1.588998	1547	7476	49
12	2876	6193	.629734	7973	1763	6608	48
13	3122	6038	.630140	6949	1980	5742	47
14	3368	5883	0546	5926	2197	4876	46
15	.533615	.845728	.630953	1.584904	1.182414	1.874012	45
16	3861	5573	1360	3883	2631	3148	44
17	4106	5417	1767	2863	2848	2286	43
18	4352	5262	2174	1844	3065	1424	42
19	4598	5106	2581	1.580825	3283	1.870564	41
20	.534844	.844951	.632988	1.579808	1.183501	1.869704	40
21	5090	4795	3396	8792	3719	8845	39
22	5335	4640	3804	7776	3937	7987	38
23	5581	4484	4211	6761	4155	7131	37
24	5827	4328	4619	5748	4374	6275	36
25	.536072	.844172	.635027	1.574735	1.184593	1.865420	35
26	6318	4016	5436	3723	4812	4566	34
27	6563	3860	5844	2713	5031	3713	33
28	6809	3704	6253	1703	5250	2860	32
29	7054	3548	6661	1.570694	5469	2009	31
30	.537300	.843391	.637070	1.569686	1.185689	1.861159	30
31	7545	3235	7479	8678	5909	1.860310	29
32	7790	3079	7888	7672	6129	1.859461	28
33	8035	2922	8298	6667	6349	8614	27
34	8281	2766	8707	5662	6569	7767	26
35	.538526	.842609	.639117	1.564659	1.186790	1.856922	25
36	8771	2452	9527	3656	7011	6077	24
37	9016	2296	.639937	2655	7232	5233	23
38	9261	2139	.640347	1654	7453	4390	22
39	9506	1982	0757	1.560654	7674	3548	21
40	.539751	.841825	.641167	1.559655	1.187895	1.852707	20
41	.539996	1668	.641578	8657	8117	1867	19
42	.540240	1511	1989	7660	8339	1028	18
43	0485	1354	2399	6664	8561	1.850190	17
44	0730	1196	2810	5669	8783	1.849352	16
45	.540974	.841039	.643222	1.554674	1.189005	1.848516	15
46	1219	0882	3633	3681	9228	7681	14
47	1464	0724	4044	2688	9451	6846	13
48	1708	0567	4456	1696	9674	6012	12
49	1953	0409	4868	1.550705	1.189897	5179	11
50	.542197	.840251	.645280	1.549715	1.190120	1.844348	10
51	2442	.840094	5692	8726	0344	3517	9
52	2686	.839936	6104	7738	0567	2687	8
53	2930	9778	6516	6751	0791	1857	7
54	3174	9620	6929	5765	1015	1029	6
55	.543419	.839462	.647342	1.544779	1.191239	1.840202	5
56	3663	9304	7755	3795	1464	1.839375	4
57	3907	9146	8168	2811	1688	8550	3
58	4151	8987	8581	1828	1913	7725	2
59	4395	8829	8994	1.540846	2138	6901	1
60	.544639	.838671	.649408	1.539865	1.192363	1.836078	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

122° 57°

33° 146°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.544639	.838671	.649408	1.539865	1.192363	1.836078	60
1	4883	8512	.649821	8885	2589	5256	59
2	5127	8354	.650235	7905	2814	4435	58
3	5371	8195	0649	6927	3040	3615	57
4	5615	8036	1063	5949	3266	2796	56
5	.545858	.837878	.651477	1.534973	1.193492	1.831977	55
6	6102	7719	1892	3997	3718	1160	54
7	6346	7560	2306	3022	3945	1.830343	53
8	6589	7401	2721	2048	4171	1.829527	52
9	6833	7242	3136	1075	4398	8713	51
10	.547076	.837083	.653551	1.530102	1.194625	1.827899	50
11	7320	6924	3966	1.529131	4852	7085	49
12	7563	6764	4382	8160	5080	6273	48
13	7807	6605	4797	7190	5307	5462	47
14	8050	6446	5213	6222	5535	4651	46
15	.548293	.836286	.655629	1.525253	1.195763	1.823842	45
16	8536	6127	6045	4286	5991	3033	44
17	8780	5967	6461	3320	6219	2225	43
18	9023	5807	6877	2355	6448	1418	42
19	9266	5648	7294	1390	6677	1.820612	41
20	.549509	.835488	.657710	1.520426	1.196906	1.819806	40
21	9752	5328	8127	1.519463	7135	9002	39
22	.549995	5168	8544	8501	7364	8199	38
23	.550238	5008	8961	7540	7593	7396	37
24	0481	4848	9379	6580	7823	6594	36
25	.550724	.834688	.659796	1.515620	1.198053	1.815793	35
26	0966	4527	.660214	4661	8283	4993	34
27	1209	4367	0631	3704	8513	4194	33
28	1452	4207	1049	2747	8744	3395	32
29	1694	4046	1467	1790	8974	2598	31
30	.551937	.833886	.661886	1.510835	1.199205	1.811801	30
31	2180	3725	2304	1.509881	9436	1005	29
32	2422	3565	2723	8927	9667	1.810210	28
33	2664	3404	3141	7974	1.199898	1.809416	27
34	2907	3243	3560	7022	1.200130	8623	26
35	.553149	.833082	.663979	1.506071	1.200362	1.807830	25
36	3392	2921	4398	5121	0594	7039	24
37	3634	2760	4818	4172	0826	6248	23
38	3876	2599	5237	3223	1058	5458	22
39	4118	2438	5657	2275	1291	4669	21
40	.554360	.832277	.666077	1.501328	1.201523	1.803881	20
41	4602	2115	6497	1.500382	1756	3094	19
42	4844	1954	6917	1.499437	1989	2307	18
43	5086	1793	7337	8492	2223	1521	17
44	5328	1631	7758	7549	2456	1.800736	16
45	.555570	.831470	.668179	1.496606	1.202690	1.799952	15
46	5812	1308	8599	5664	2924	9169	14
47	6054	1146	9020	4723	3158	8387	13
48	6296	0984	9442	3782	3392	7605	12
49	6537	0823	.669863	2843	3626	6825	11
50	.556779	.830661	.670284	1.491904	1.203861	1.796045	10
51	7021	0499	0706	0966	4096	5266	9
52	7262	0337	1128	1.490029	4331	4488	8
53	7504	0174	1550	1.489092	4566	3710	7
54	7745	.830012	1972	8157	4801	2934	6
55	.557987	.829850	.672394	1.487222	1.205037	1.792158	5
56	8228	9688	2817	6288	5273	1383	4
57	8469	9525	3240	5355	5509	1.790609	3
58	8710	9363	3662	4423	5745	1.789836	2
59	8952	9200	4085	3492	5981	9063	1
60	.559193	.829038	.674509	1.482561	1.206218	1.788292	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

123° 56°

34° 145°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.559193	.829038	.674509	1.482561	1.206218	1.788292	60
1	9434	8875	4932	1631	6455	7521	59
2	9675	8712	5355	1.480702	6692	6751	58
3	.559916	8549	5779	1.479774	6929	5982	57
4	.560157	8386	6203	8846	7166	5213	56
5	.560398	.828223	.676627	1.477920	1.207404	1.784446	55
6	0639	8060	7051	6994	7641	3679	54
7	0880	7897	7475	6069	7879	2913	53
8	1121	7734	7900	5144	8118	2148	52
9	1361	7571	8324	4221	8356	1384	51
10	.561602	.827407	.678749	1.473298	1.208594	1.780620	50
11	1843	7244	9174	2376	8833	1.779857	49
12	2083	7081	.679599	1455	9072	9095	48
13	2324	6917	.680025	1.470535	9311	8334	47
14	2564	6753	0450	1.469615	9550	7574	46
15	.562805	.826590	.680876	1.468697	1.209790	1.776815	45
16	3045	6426	1302	7779	1.210030	6056	44
17	3286	6262	1728	6862	0270	5298	43
18	3526	6098	2154	5945	0510	4541	42
19	3766	5934	2580	5030	0750	3785	41
20	.564007	.825770	.683007	1.464115	1.210991	1.773029	40
21	4247	5606	3433	3201	1231	2274	39
22	4487	5442	3860	2287	1472	1520	38
23	4727	5278	4287	1375	1713	0767	37
24	4967	5113	4714	1.460463	1954	1.770015	36
25	.565207	.824949	.685142	1.459552	1.212196	1.769263	35
26	5447	4785	5569	8642	2438	8513	34
27	5687	4620	5997	7733	2680	7763	33
28	5927	4456	6425	6824	2922	7013	32
29	6166	4291	6853	5916	3164	6265	31
30	.566406	.824126	.687281	1.455009	1.213406	1.765517	30
31	6646	3961	7709	4103	3649	4770	29
32	6886	3797	8138	3197	3892	4024	28
33	7125	3632	8567	2292	4135	3279	27
34	7365	3467	8995	1388	4378	2535	26
35	.567604	.823302	.689425	1.450485	1.214622	1.761791	25
36	7844	3136	.689854	1.449583	4866	1048	24
37	8083	2971	.690283	8681	5109	1.760306	23
38	8323	2806	0713	7780	5354	1.759564	22
39	8562	2641	1143	6880	5598	8824	21
40	.568801	.822475	.691572	1.445980	1.215842	1.758084	20
41	9040	2310	2003	5081	6087	7345	19
42	9280	2144	2433	4183	6332	6606	18
43	9519	1978	2863	3286	6577	5869	17
44	9758	1813	3294	2390	6822	5132	16
45	.569997	.821647	.693725	1.441494	1.217068	1.754396	15
46	.570236	1481	4156	1.440599	7313	3661	14
47	0475	1315	4587	1.439705	7559	2926	13
48	0714	1149	5018	8811	7805	2192	12
49	0952	0983	5450	7919	8052	1459	11
50	.571191	.820817	.695881	1.437027	1.218298	1.750727	10
51	1430	0651	6313	6136	8545	1.749996	9
52	1669	0485	6745	5245	8792	9265	8
53	1907	0318	7177	4355	9039	8535	7
54	2146	.820152	7610	3466	9286	7806	6
55	.572384	.819985	.698042	1.432578	1.219534	1.747078	5
56	2623	9819	8475	1691	1.219782	6350	4
57	2861	9652	8908	1.430804	1.220030	5623	3
58	3100	9486	9341	1.429918	0278	4897	2
59	3338	9319	.699774	9033	0526	4171	1
60	.573576	.819152	.700208	1.428148	1.220775	1.743447	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

124° 55°

35° 144°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.573576	.819152	.700208	1.428148	1.220775	1.743447	60
1	3815	8985	0641	7264	1023	2723	59
2	4053	8818	1075	6381	1272	2000	58
3	4291	8651	1509	5499	1521	1277	57
4	4529	8484	1943	4617	1771	1.740556	56
5	.574767	.818317	.702377	1.423736	1.222020	1.739835	55
6	5005	8150	2812	2856	2270	9115	54
7	5243	7982	3246	1977	2520	8395	53
8	5481	7815	3681	1098	2770	7676	52
9	5719	7648	4116	1.420220	3021	6958	51
10	.575957	.817480	.704551	1.419343	1.223271	1.736241	50
11	6195	7313	4987	8466	3522	5525	49
12	6432	7145	5422	7590	3773	4809	48
13	6670	6977	5858	6715	4024	4094	47
14	6908	6809	6294	5841	4276	3380	46
15	.577145	.816642	.706730	1.414967	1.224527	1.732666	45
16	7383	6474	7166	4094	4779	1953	44
17	7620	6306	7603	3222	5031	1241	43
18	7858	6138	8039	2351	5284	1.730530	42
19	8095	5969	8476	1480	5536	1.729819	41
20	.578332	.815801	.708913	1.410610	1.225789	1.729110	40
21	8570	5633	9350	1.409740	6042	8400	39
22	8807	5465	.709788	8872	6295	7692	38
23	9044	5296	.710225	8004	6548	6984	37
24	9281	5128	0663	7137	6801	6277	36
25	.579518	.814959	.711101	1.406270	1.227055	1.725571	35
26	9755	4791	1539	5404	7309	4866	34
27	.579992	4622	1977	4539	7563	4161	33
28	.580229	4453	2416	3675	7818	3457	32
29	0466	4284	2854	2811	8072	2753	31
30	.580703	.814116	.713293	1.401948	1.228327	1.722051	30
31	0940	3947	3732	1086	8582	1349	29
32	1176	3778	4171	1.400224	8837	1.720648	28
33	1413	3608	4611	1.399364	9092	1.719947	27
34	1650	3439	5050	8503	9348	9247	26
35	.581886	.813270	.715490	1.397644	1.229604	1.718548	25
36	2123	3101	5930	6785	1.229860	7850	24
37	2359	2931	6370	5927	1.230116	7152	23
38	2596	2762	6810	5070	0373	6456	22
39	2832	2592	7250	4213	0629	5759	21
40	.583069	.812423	.717691	1.393357	1.230886	1.715064	20
41	3305	2253	8132	2502	1143	4369	19
42	3541	2084	8573	1647	1400	3675	18
43	3777	1914	9014	1.390793	1658	2982	17
44	4014	1744	9455	1.389940	1916	2289	16
45	.584250	.811574	.719897	1.389088	1.232174	1.711597	15
46	4486	1404	.720339	8236	2432	0906	14
47	4722	1234	0781	7385	2690	1.710215	13
48	4958	1064	1223	6534	2949	1.709525	12
49	5194	0894	1665	5684	3207	8836	11
50	.585429	.810723	.722108	1.384835	1.233466	1.708148	10
51	5665	0553	2550	3987	3726	7460	9
52	5901	0383	2993	3139	3985	6773	8
53	6137	0212	3436	2292	4245	6087	7
54	6372	.810042	3879	1446	4504	5401	6
55	.586608	.809871	.724323	1.380600	1.234764	1.704716	5
56	6844	9700	4766	1.379755	5025	4032	4
57	7079	9530	5210	8911	5285	3348	3
58	7314	9359	5654	8067	5546	2665	2
59	7550	9188	6098	7224	5807	1983	1
60	.587785	.809017	.726543	1.376382	1.236068	1.701302	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

125° 54°

36° 143°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.587785	.809017	.726543	1.376382	1.236068	1.701302	60
1	8021	8846	6987	5540	6329	1.700621	59
2	8256	8675	7432	4699	6591	1.699941	58
3	8491	8504	7877	3859	6853	9261	57
4	8726	8333	8322	3019	7115	8582	56
5	.588961	.808161	.728767	1.372181	1.237377	1.697904	55
6	9196	7990	9213	1342	7639	7227	54
7	9431	7818	.729658	1.370505	7902	6550	53
8	9666	7647	.730104	1.369668	8165	5874	52
9	.589901	7475	0550	8832	8428	5199	51
10	.590136	.807304	.730996	1.367996	1.238691	1.694524	50
11	0371	7132	1443	7161	8955	3850	49
12	0606	6960	1889	6327	9218	3177	48
13	0840	6788	2336	5493	9482	2505	47
14	1075	6617	2783	4660	1.239746	1833	46
15	.591310	.806445	.733230	1.363828	1.240011	1.691161	45
16	1544	6273	3678	2996	0275	1.690491	44
17	1779	6100	4125	2165	0540	1.689821	43
18	2013	5928	4573	1335	0805	9152	42
19	2248	5756	5021	1.360505	1070	8483	41
20	.592482	.805584	.735469	1.359676	1.241336	1.687815	40
21	2716	5411	5917	8848	1602	7148	39
22	2951	5239	6366	8020	1867	6481	38
23	3185	5066	6815	7193	2134	5815	37
24	3419	4894	7264	6367	2400	5150	36
25	.593653	.804721	.737713	1.355541	1.242666	1.684486	35
26	3887	4548	8162	4716	2933	3822	34
27	4121	4376	8611	3892	3200	3159	33
28	4355	4203	9061	3068	3467	2496	32
29	4589	4030	9511	2245	3735	1834	31
30	.594823	.803857	.739961	1.351422	1.244003	1.681173	30
31	5057	3684	.740411	1.350601	4270	1.680512	29
32	5290	3511	0862	1.349779	4539	1.679853	28
33	5524	3337	1312	8959	4807	9193	27
34	5758	3164	1763	8139	5075	8535	26
35	.595991	.802991	.742214	1.347320	1.245344	1.677877	25
36	6225	2817	2666	6501	5613	7220	24
37	6458	2644	3117	5683	5882	6563	23
38	6692	2470	3569	4866	6152	5907	22
39	6925	2297	4020	4049	6421	5252	21
40	.597159	.802123	.744472	1.343233	1.246691	1.674597	20
41	7392	1949	4925	2418	6961	3943	19
42	7625	1776	5377	1603	7232	3290	18
43	7858	1602	5830	1.340789	7502	2637	17
44	8091	1428	6282	1.339975	7773	1985	16
45	.598325	.801254	.746735	1.339162	1.248044	1.671334	15
46	8558	1080	7189	8350	8315	0683	14
47	8791	0906	7642	7539	8587	1.670033	13
48	9024	0731	8096	6728	8858	1.669383	12
49	9256	0557	8549	5917	9130	8735	11
50	.599489	.800383	.749003	1.335108	1.249402	1.668086	10
51	9722	0208	9458	4298	9675	7439	9
52	.599955	.800034	.749912	3490	1.249947	6792	8
53	.600188	.799859	.750366	2682	1.250220	6146	7
54	0420	9685	0821	1875	0493	5500	6
55	.600653	.799510	.751276	1.331068	1.250766	1.664855	5
56	0885	9335	1731	1.330262	1040	4211	4
57	1118	9160	2187	1.329457	1313	3567	3
58	1350	8985	2642	8652	1587	2924	2
59	1583	8811	3098	7848	1861	2282	1
60	.601815	.798636	.753554	1.327045	1.252136	1.661640	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

126° 53°

37° 142°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.601815	.798636	.753554	1.327045	1.252136	1.661640	60
1	2047	8460	4010	6242	2410	0999	59
2	2280	8285	4467	5440	2685	1.660359	58
3	2512	8110	4923	4638	2960	1.659719	57
4	2744	7935	5380	3837	3235	9080	56
5	.602976	.797759	.755837	1.323037	1.253511	1.658441	55
6	3208	7584	6294	2237	3787	7803	54
7	3440	7408	6751	1438	4062	7166	53
8	3672	7233	7209	1.320639	4339	6529	52
9	3904	7057	7667	1.319841	4615	5893	51
10	.604136	.796882	.758125	1.319044	1.254892	1.655258	50
11	4367	6706	8583	8247	5169	4623	49
12	4599	6530	9041	7451	5446	3989	48
13	4831	6354	9500	6656	5723	3355	47
14	5062	6178	.759959	5861	6000	2722	46
15	.605294	.796002	.760418	1.315067	1.256278	1.652090	45
16	5526	5826	0877	4273	6556	1458	44
17	5757	5650	1336	3480	6834	0827	43
18	5988	5473	1796	2688	7113	1.650197	42
19	6220	5297	2256	1896	7392	1.649567	41
20	.606451	.795121	.762716	1.311105	1.257671	1.648938	40
21	6682	4944	3176	1.310314	7950	8309	39
22	6914	4768	3636	1.309524	8229	7681	38
23	7145	4591	4097	8735	8509	7054	37
24	7376	4415	4558	7946	8789	6427	36
25	.607607	.794238	.765019	1.307157	1.259069	1.645801	35
26	7838	4061	5480	6370	9349	5175	34
27	8069	3884	5941	5583	9629	4551	33
28	8300	3707	6403	4796	1.259910	3926	32
29	8531	3530	6865	4011	1.260191	3303	31
30	.608761	.793353	.767327	1.303225	1.260472	1.642680	30
31	8992	3176	7789	2441	0754	2057	29
32	9223	2999	8252	1657	1036	1435	28
33	9454	2822	8714	0873	1317	0814	27
34	9684	2644	9177	1.300090	1600	1.640194	26
35	.609915	.792467	.769640	1.299308	1.261882	1.639574	25
36	.610145	2290	.770104	8526	2165	8954	24
37	0376	2112	0567	7745	2448	8335	23
38	0606	1935	1031	6965	2731	7717	22
39	0836	1757	1495	6185	3014	7100	21
40	.611067	.791579	.771959	1.295406	1.263298	1.636483	20
41	1297	1401	2423	4627	3581	5866	19
42	1527	1224	2888	3849	3865	5251	18
43	1757	1046	3353	3071	4150	4636	17
44	1987	0868	3818	2294	4434	4021	16
45	.612217	.790690	.774283	1.291518	1.264719	1.633407	15
46	2447	0511	4748	1.290742	5004	2794	14
47	2677	0333	5214	1.289967	5289	2181	13
48	2907	.790155	5680	9192	5574	1569	12
49	3137	.789977	6146	8418	5860	0957	11
50	.613367	.789798	.776612	1.287645	1.266146	1.630346	10
51	3596	9620	7078	6872	6432	1.629736	9
52	3826	9441	7545	6099	6719	9126	8
53	4056	9263	8012	5328	7005	8517	7
54	4285	9084	8479	4557	7292	7908	6
55	.614515	.788905	.778946	1.283786	1.267579	1.627300	5
56	4744	8727	9414	3016	7866	6693	4
57	4974	8548	.779881	2247	8154	6086	3
58	5203	8369	.780349	1478	8442	5480	2
59	5432	8190	0817	1.280709	8730	4874	1
60	.615661	.788011	.781286	1.279942	1.269018	1.624269	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

127° 52°

38° 141°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.615661	.788011	.781286	1.279942	1.269018	1.624269	60
1	5891	7832	1754	9174	9307	3665	59
2	6120	7652	2223	8408	9596	3061	58
3	6349	7473	2692	7642	1.269885	2458	57
4	6578	7294	3161	6876	1.270174	1855	56
5	.616807	.787114	.783631	1.276112	1.270463	1.621253	55
6	7036	6935	4100	5347	0753	0651	54
7	7265	6756	4570	4584	1043	1.620050	53
8	7494	6576	5040	3820	1333	1.619450	52
9	7722	6396	5510	3058	1624	8850	51
10	.617951	.786217	.785981	1.272296	1.271914	1.618251	50
11	8180	6037	6451	1534	2205	7652	49
12	8408	5857	6922	0773	2496	7054	48
13	8637	5677	7394	1.270013	2788	6457	47
14	8865	5497	7865	1.269253	3079	5860	46
15	.619094	.785317	.788336	1.268494	1.273371	1.615264	45
16	9322	5137	8808	7735	3663	4668	44
17	9551	4957	9280	6977	3956	4073	43
18	.619779	4776	.789752	6220	4248	3478	42
19	.620007	4596	.790225	5463	4541	2884	41
20	.620235	.784416	.790697	1.264706	1.274834	1.612291	40
21	0464	4235	1170	3950	5128	1698	39
22	0692	4055	1643	3195	5421	1106	38
23	0920	3874	2117	2440	5715	1.610514	37
24	1148	3693	2590	1686	6009	1.609923	36
25	.621376	.783513	.793064	1.260932	1.276303	1.609332	35
26	1604	3332	3538	1.260179	6598	8742	34
27	1831	3151	4012	1.259427	6893	8153	33
28	2059	2970	4486	8675	7188	7564	32
29	2287	2789	4961	7923	7483	6976	31
30	.622515	.782608	.795436	1.257172	1.277779	1.606388	30
31	2742	2427	5911	6422	8074	5801	29
32	2970	2246	6386	5672	8370	5214	28
33	3197	2065	6862	4923	8667	4628	27
34	3425	1883	7337	4174	8963	4043	26
35	.623652	.781702	.797813	1.253426	1.279260	1.603458	25
36	3880	1520	8290	2678	9557	2873	24
37	4107	1339	8766	1931	1.279854	2290	23
38	4334	1157	9242	1185	1.280152	1706	22
39	4561	0976	.799719	1.250439	0450	1124	21
40	.624789	.780794	.800196	1.249693	1.280748	1.600542	20
41	5016	0612	0674	8948	1046	1.599960	19
42	5243	0430	1151	8204	1344	9379	18
43	5470	0248	1629	7460	1643	8799	17
44	5697	.780067	2107	6717	1942	8219	16
45	.625923	.779884	.802585	1.245974	1.282241	1.597639	15
46	6150	9702	3063	5232	2541	7061	14
47	6377	9520	3542	4490	2840	6482	13
48	6604	9338	4021	3749	3140	5905	12
49	6830	9156	4500	3009	3441	5328	11
50	.627057	.778973	.804979	1.242268	1.283741	1.594751	10
51	7284	8791	5458	1529	4042	4175	9
52	7510	8608	5938	0790	4343	3600	8
53	7737	8426	6418	1.240052	4644	3025	7
54	7963	8243	6898	1.239314	4945	2450	6
55	.628189	.778060	.807379	1.238576	1.285247	1.591877	5
56	8416	7878	7859	7839	5549	1303	4
57	8642	7695	8340	7103	5851	0731	3
58	8868	7512	8821	6367	6154	1.590158	2
59	9094	7329	9303	5632	6457	1.589587	1
60	.629320	.777146	.809784	1.234897	1.286760	1.589016	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

128° 51°

39° 140°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.629320	.777146	.809784	1.234897	1.286760	1.589016	60
1	9546	6963	.810266	4163	7063	8445	59
2	9772	6780	.810748	3429	7366	7875	58
3	.629998	6596	1230	2696	7670	7306	57
4	.630224	6413	1712	1963	7974	6737	56
5	.630450	.776230	.812195	1.231231	1.288278	1.586169	55
6	0676	6046	2678	1.230500	8583	5601	54
7	0902	5863	3161	1.229769	8887	5033	53
8	1127	5679	3644	9038	9192	4467	52
9	1353	5496	4128	8308	9498	3900	51
10	.631578	.775312	.814612	1.227579	1.289803	1.583335	50
11	1804	5128	5096	6850	1.290109	2770	49
12	2029	4944	5580	6121	0415	2205	48
13	2255	4761	6065	5393	0721	1641	47
14	2480	4577	6549	4666	1028	1078	46
15	.632705	.774393	.817034	1.223939	1.291335	1.580515	45
16	2931	4209	7519	3212	1642	1.579952	44
17	3156	4024	8005	2487	1949	9390	43
18	3381	3840	8491	1761	2256	8829	42
19	3606	3656	8976	1036	2564	8268	41
20	.633831	.773472	.819463	1.220312	1.292872	1.577708	40
21	4056	3287	.819949	1.219588	3181	7148	39
22	4281	3103	.820435	8865	3489	6589	38
23	4506	2918	0922	8142	3798	6030	37
24	4731	2734	1409	7420	4107	5472	36
25	.634955	.772549	.821897	1.216698	1.294416	1.574914	35
26	5180	2364	2384	5977	4726	4357	34
27	5405	2179	2872	5256	5036	3800	33
28	5629	1995	3360	4536	5346	3244	32
29	5854	1810	3848	3816	5656	2689	31
30	.636078	.771625	.824336	1.213097	1.295967	1.572134	30
31	6303	1440	4825	2378	6278	1579	29
32	6527	1254	5314	1660	6589	1025	28
33	6751	1069	5803	0942	6900	1.570472	27
34	6976	0884	6292	1.210225	7212	1.569919	26
35	.637200	.770699	.826782	1.209509	1.297524	1.569366	25
36	7424	0513	7272	8792	7836	8815	24
37	7648	0328	7762	8077	8149	8263	23
38	7872	.770142	8252	7362	8461	7712	22
39	8096	.769957	8743	6647	8774	7162	21
40	.638320	.769771	.829234	1.205933	1.299088	1.566612	20
41	8544	9585	.829725	5219	9401	6063	19
42	8768	9400	.830216	4506	1.299715	5514	18
43	8992	9214	0707	3793	1.300029	4966	17
44	9215	9028	1199	3081	0343	4418	16
45	.639439	.768842	.831691	1.202369	1.300658	1.563871	15
46	9663	8656	2183	1658	0972	3324	14
47	.639886	8470	2676	0947	1287	2778	13
48	.640110	8284	3169	1.200237	1603	2232	12
49	0333	8097	3662	1.199528	1918	1687	11
50	.640557	767911	.834155	1.198818	1.302234	1.561142	10
51	0780	7725	4648	8110	2550	0598	9
52	1003	7538	5142	7402	2867	1.560055	8
53	1226	7352	5636	6694	3183	1.559511	7
54	1450	7165	6130	5987	3500	8969	6
55	.641673	.766979	.836624	1.195280	1.303817	1.558427	5
56	1896	6792	7119	4574	4135	7885	4
57	2119	6605	7614	3868	4453	7344	3
58	2342	6418	8109	3163	4771	6803	2
59	2565	6231	8604	2458	5089	6263	1
60	.642788	.766044	.839100	1.191754	1.305407	1.555724	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

129° 50°

40° 139°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.642788	.766044	.839100	1.191754	1.305407	1.555724	60
1	3010	5857	.839595	1050	5726	5185	59
2	3233	5670	.840092	1.190347	6045	4646	58
3	3456	5483	0588	1.189644	6364	4108	57
4	3679	5296	1084	8941	6684	3571	56
5	.643901	.765109	.841581	1.188240	1.307004	1.553034	55
6	4124	4921	2078	7538	7324	2497	54
7	4346	4734	2575	6837	7644	1961	53
8	4569	4547	3073	6137	7965	1425	52
9	4791	4359	3571	5437	8286	0890	51
10	.645013	.764171	.844069	1.184738	1.308607	1.550356	50
11	5236	3984	4567	4039	8928	1.549822	49
12	5458	3796	5066	3340	9250	9288	48
13	5680	3608	5564	2642	9572	8755	47
14	5902	3420	6063	1945	1.309894	8223	46
15	.646124	.763232	.846562	1.181248	1.310217	1.547691	45
16	6346	3044	7062	1.180551	0540	7159	44
17	6568	2856	7562	1.179855	0863	6628	43
18	6790	2668	8062	9160	1186	6097	42
19	7012	2480	8562	8464	1510	5567	41
20	.647233	.762292	.849062	1.177770	1.311833	1.545038	40
21	7455	2104	.849563	7076	2158	4509	39
22	7677	1915	.850064	6382	2482	3980	38
23	7898	1727	0565	5689	2807	3452	37
24	8120	1538	1067	4996	3132	2924	36
25	.648341	.761350	.851568	1.174304	1.313457	1.542397	35
26	8563	1161	2070	3612	3782	1871	34
27	8784	0972	2573	2921	4108	1345	33
28	9006	0784	3075	2230	4434	0819	32
29	9227	0595	3578	1539	4760	1.540294	31
30	.649448	.760406	.854081	1.170850	1.315087	1.539769	30
31	9669	0217	4584	1.170160	5414	9245	29
32	.649890	.760028	5087	1.169471	5741	8721	28
33	.650111	.759839	5591	8783	6068	8198	27
34	0332	9650	6095	8095	6396	7675	26
35	.650553	.759461	.856599	1.167407	1.316724	1.537153	25
36	0774	9271	7104	6720	7052	6631	24
37	0995	9082	7608	6033	7381	6110	23
38	1216	8893	8113	5347	7710	5589	22
39	1437	8703	8619	4662	8039	5069	21
40	.651657	.758514	.859124	1.163976	1.318368	1.534549	20
41	1878	8324	.859630	3292	8698	4030	19
42	2098	8134	.860136	2607	9027	3511	18
43	2319	7945	0642	1923	9358	2993	17
44	2539	7755	1148	1240	1.319688	2475	16
45	.652760	.757565	.861655	1.160557	1.320019	1.531957	15
46	2980	7375	2162	1.159875	0350	1440	14
47	3200	7185	2669	9193	0681	0924	13
48	3421	6995	3177	8511	1013	1.530408	12
49	3641	6805	3685	7830	1344	1.529892	11
50	.653861	.756615	.864193	1.157149	1.321677	1.529377	10
51	4081	6425	4701	6469	2009	8863	9
52	4301	6234	5209	5790	2342	8349	8
53	4521	6044	5718	5110	2675	7835	7
54	4741	5853	6227	4432	3008	7322	6
55	.654961	.755663	.866736	1.153753	1.323341	1.526809	5
56	5180	5472	7246	3075	3675	6297	4
57	5400	5282	7756	2398	4009	5785	3
58	5620	5091	8266	1721	4343	5274	2
59	5839	4900	8776	1044	4678	4763	1
60	.656059	.754710	.869287	1.150368	1.325013	1.524253	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

130° 49°

41° 138°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.656059	.754710	.869287	1.150368	1.325013	1.524253	60
1	6279	4519	.869798	1.149693	5348	5743	59
2	6498	4328	.870309	9018	5684	3234	58
3	6717	4137	0820	8343	6019	2725	57
4	6937	3946	1332	7669	6355	2217	56
5	.657156	.753755	.871843	1.146995	1.326692	1.521709	55
6	7375	3563	2356	6322	7028	1201	54
7	7594	3372	2868	5649	7365	0694	53
8	7814	3181	3381	4976	7702	1.520188	52
9	8033	2989	3894	4304	8040	1.519682	51
10	.658252	.752798	.874407	1.143633	1.328378	1.519176	50
11	8471	2606	4920	2961	8716	8671	49
12	8689	2415	5434	2291	9054	8166	48
13	8908	2223	5948	1621	9393	7662	47
14	9127	2032	6462	0951	1.329731	7158	46
15	.659346	.751840	.876976	1.140281	1.330071	1.516655	45
16	9564	1648	7491	1.139613	0410	6152	44
17	.659783	1456	8006	8944	0750	5650	43
18	.660002	1264	8521	8276	1090	5148	42
19	0220	1072	9037	7609	1430	4646	41
20	.660439	.750880	.879553	1.136941	1.331771	1.514145	40
21	0657	0688	.880069	6275	2112	3645	39
22	0875	0496	0585	5609	2453	3145	38
23	1094	0303	1102	4943	2794	2645	37
24	1312	.750111	1619	4277	3136	2146	36
25	.661530	.749919	.882136	1.133612	1.333478	1.511647	35
26	1748	9726	2653	2948	3820	1149	34
27	1966	9534	3171	2284	4163	0651	33
28	2184	9341	3689	1620	4506	1.510154	32
29	2402	9148	4207	0957	4849	1.509657	31
30	.662620	.748956	.884725	1.130294	1.335192	1.509160	30
31	2838	8763	5244	1.129632	5536	8665	29
32	3056	8570	5763	8970	5880	8169	28
33	3273	8377	6282	8309	6225	7674	27
34	3491	8184	6802	7648	6569	7179	26
35	.663709	.747991	.887321	1.126987	1.336914	1.506685	25
36	3926	7798	7842	6327	7259	6191	24
37	4144	7605	8362	5667	7605	5698	23
38	4361	7412	8882	5008	7951	5205	22
39	4579	7218	9403	4349	8297	4713	21
40	.664796	.747025	.889924	1.123691	1.338643	1.504221	20
41	5013	6832	.890446	3033	8990	3730	19
42	5230	6638	0967	2375	9337	3239	18
43	5448	6445	1489	1718	1.339684	2748	17
44	5665	6251	2012	1062	1.340032	2258	16
45	.665882	.746057	.892534	1.120405	1.340379	1.501768	15
46	6099	5864	3057	1.119750	0728	1279	14
47	6316	5670	3580	9094	1076	0790	13
48	6532	5476	4103	8439	1425	1.500302	12
49	6749	5282	4627	7785	1774	1.499814	11
50	.666966	.745088	.895151	1.117130	1.342123	1.499327	10
51	7183	4894	5675	6477	2473	8840	9
52	7399	4700	6199	5823	2823	8353	8
53	7616	4506	6724	5171	3173	7867	7
54	7833	4312	7249	4518	3523	7381	6
55	.668049	.744117	.897774	1.113866	1.343874	1.496896	5
56	8265	3923	8299	3215	4225	6411	4
57	8482	3728	8825	2563	4577	5927	3
58	8698	3534	9351	1913	4928	5443	2
59	8914	3339	.899877	1262	5280	4960	1
60	.669131	.743145	.900404	1.110613	1.345633	1.494477	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

131° 48°

42° 137°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.669131	.743145	.900404	1.110613	1.345633	1.494477	60
1	9347	2950	0931	1.109963	5985	3994	59
2	9563	2755	1458	9314	6338	3512	58
3	9779	2561	1985	8665	6691	3030	57
4	.669995	2366	2513	8017	7045	2549	56
5	.670211	.742171	.903041	1.107369	1.347399	1.492068	55
6	0427	1976	3569	6722	7753	1588	54
7	0642	1781	4098	6075	8107	1108	53
8	0858	1586	4627	5428	8462	0628	52
9	1074	1391	5156	4782	8817	1.490149	51
10	.671289	.741195	.905685	1.104137	1.349172	1.489670	50
11	1505	1000	6215	3491	9528	9192	49
12	1721	0805	6745	2846	1.349884	8714	48
13	1936	0609	7275	2202	1.350240	8237	47
14	2151	0414	7805	1558	0596	7760	46
15	.672367	.740218	.908336	1.100914	1.350953	1.487283	45
16	2582	.740023	8867	1.100271	1310	6807	44
17	2797	.739827	9398	1.099628	1668	6332	43
18	3013	9631	.909930	8986	2025	5856	42
19	3228	9435	.910462	8344	2383	5382	41
20	.673443	.739239	.910994	1.097702	1.352742	1.484907	40
21	3658	9043	1526	7061	3100	4433	39
22	3873	8848	2059	6420	3459	3960	38
23	4088	8651	2592	5780	3818	3487	37
24	4302	8455	3125	5140	4178	3014	36
25	.674517	.738259	.913659	1.094500	1.354538	1.482542	35
26	4732	8063	4193	3861	4898	2070	34
27	4947	7867	4727	3222	5258	1599	33
28	5161	7670	5261	2584	5619	1118	32
29	5376	7474	5796	1946	5980	0657	31
30	.675590	.737277	.916331	1.091309	1.356342	1.480187	30
31	5805	7081	6866	0671	6703	1.479718	29
32	6019	6884	7402	1.090035	7065	9248	28
33	6233	6687	7938	1.089398	7428	8779	27
34	6448	6491	8474	8762	7790	8311	26
35	.676662	.736294	.919010	1.088127	1.358153	1.477843	25
36	6876	6097	.919547	7492	8516	7376	24
37	7090	5900	.920084	6857	8880	6908	23
38	7304	5703	0621	6223	9244	6442	22
39	7518	5506	1159	5589	9608	5975	21
40	.677732	.735309	.921697	1.084955	1.359972	1.475509	20
41	7946	5112	2235	4322	1.360337	5044	19
42	8160	4915	2773	3690	0702	4579	18
43	8373	4717	3312	3057	1068	4114	17
44	8587	4520	3851	2425	1433	3650	16
45	.678801	.734323	.924390	1.081794	1.361799	1.473186	15
46	9014	4125	4930	1163	2166	2723	14
47	9228	3927	5470	1.080532	2532	2260	13
48	9441	3730	6010	1.079902	2899	1797	12
49	9655	3532	6551	9272	3267	1335	11
50	.679868	.733334	.927091	1.078642	1.363634	1.470874	10
51	.680081	3137	7632	8013	4002	1.470412	9
52	0295	2939	8174	7384	4370	1.469951	8
53	0508	2741	8715	6756	4739	9491	7
54	0721	2543	9257	6128	5108	9031	6
55	.680934	.732345	.929800	1.075501	1.365477	1.468571	5
56	1147	2147	.930342	4873	5846	8112	4
57	1360	1949	0885	4247	6216	7653	3
58	1573	1750	1428	3620	6586	7195	2
59	1786	1552	1971	2994	6957	6737	1
60	.681998	.731354	.932515	1.072369	1.367327	1.466279	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

132° 47°

43° 136°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.681998	.731354	.932515	1.072369	1.367327	1.466279	60
1	2211	1155	3059	1744	7699	5822	59
2	2424	0957	3603	1119	8070	5365	58
3	2636	0758	4148	1.070494	8442	4909	57
4	2849	0560	4693	1.069870	8814	4453	56
5	.683061	.730361	.935238	1.069247	1.369186	1.463997	55
6	3274	.730162	5783	8623	9559	3542	54
7	3486	.729963	6329	8000	1.369932	3087	53
8	3698	9765	6875	7378	1.370305	2633	52
9	3911	9566	7422	6756	0678	2179	51
10	.684123	.729367	.937968	1.066134	1.371052	1.461726	50
11	4335	9168	8515	5513	1427	1273	49
12	4547	8969	9063	4892	1801	0820	48
13	4759	8769	.939610	4271	2176	1.460368	47
14	4971	8570	.940158	3651	2551	1.459916	46
15	.685183	.728371	.940706	1.063031	1.372927	1.459464	45
16	5395	8172	1255	2412	3303	9013	44
17	5607	7972	1803	1793	3679	8562	43
18	5818	7773	2352	1174	4055	8112	42
19	6030	7573	2902	1.060556	4432	7662	41
20	.686242	.727374	.943451	1.059938	1.374809	1.457213	40
21	6453	7174	4001	9321	5187	6764	39
22	6665	6974	4552	8703	5564	6315	38
23	6876	6775	5102	8087	5943	5867	37
24	7088	6575	5653	7470	6321	5419	36
25	.687299	.726375	.946204	1.056854	1.376700	1.454971	35
26	7510	6175	6756	6239	7079	4524	34
27	7721	5975	7307	5624	7458	4077	33
28	7932	5775	7859	5009	7838	3631	32
29	8144	5575	8412	4394	8218	3185	31
30	.688355	.725374	.948965	1.053780	1.378598	1.452740	30
31	8566	5174	.949518	3166	8979	2295	29
32	8776	4974	.950071	2553	9360	1850	28
33	8987	4773	0624	1940	1.379742	1406	27
34	9198	4573	1178	1328	1.380123	0962	26
35	.689409	.724372	.951733	1.050715	1.380505	1.450518	25
36	9620	4172	2287	1.050103	0888	1.450075	24
37	.689830	3971	2842	1.049492	1270	1.449632	23
38	.690041	3771	3397	8881	1653	9190	22
39	0251	3570	3953	8270	2037	8748	21
40	.690462	.723369	.954508	1.047660	1.382420	1.448306	20
41	0672	3168	5064	7050	2804	7865	19
42	0882	2967	5621	6440	3189	7424	18
43	1093	2766	6177	5831	3573	6984	17
44	1303	2565	6734	5222	3958	6544	16
45	.691513	.722364	.957292	1.044614	1.384344	1.446104	15
46	1723	2163	7849	4006	4729	5665	14
47	1933	1962	8407	3398	5115	5226	13
48	2143	1760	8966	2790	5502	4788	12
49	2353	1559	.959524	2183	5888	4350	11
50	.692563	.721357	.960083	1.041577	1.386275	1.443912	10
51	2773	1158	0642	0970	6663	3475	9
52	2983	0954	1202	1.040364	7050	3038	8
53	3192	0753	1761	1.039759	7438	2601	7
54	3402	0551	2322	9154	7827	2165	6
55	.693611	.720349	.962882	1.038549	1.388215	1.441729	5
56	3821	.720148	3443	7944	8604	1294	4
57	4030	.719946	4004	7340	8994	0859	3
58	4240	9744	4565	6737	9383	1.440425	2
59	4449	9542	5127	6133	1.389773	1.439990	1
60	.694658	.719340	.965689	1.035530	1.390164	1.439557	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

133° 46°

44° 135°

′	Sine	Cosine	Tan.	Cotan.	Sec.	Cosec.	′
0	.694658	.719340	.965689	1.035530	1.390164	1.439557	60
1	4868	9138	6251	4928	0554	9123	59
2	5077	8936	6814	4325	0945	8690	58
3	5286	8733	7377	3724	1337	8257	57
4	5495	8531	7940	3122	1728	7825	56
5	.695704	.718329	.968504	1.032521	1.392120	1.437393	55
6	5913	8126	9067	1920	2513	6962	54
7	6122	7924	.969632	1319	2905	6531	53
8	6330	7721	.970196	0719	3298	6100	52
9	6539	7519	0761	1.030120	3692	5669	51
10	.696748	.717316	.971326	1.029520	1.394086	1.435239	50
11	6957	7113	1892	8921	4480	4810	49
12	7165	6911	2458	8323	4874	4380	48
13	7374	6708	3024	7724	5269	3952	47
14	7582	6505	3590	7126	5664	3523	46
15	.697790	.716302	.974157	1.026529	1.396059	1.433095	45
16	7999	6099	4724	5931	6455	2667	44
17	8207	5896	5291	5335	6851	2240	43
18	8415	5693	5859	4738	7248	1813	42
19	8623	5490	6427	4142	7644	1386	41
20	.698832	.715286	.976996	1.023546	1.398042	1.430960	40
21	9040	5083	7564	2951	8439	0534	39
22	9248	4880	8133	2356	8837	1.430109	38
23	9455	4676	8703	1761	9235	1.429684	37
24	9663	4473	9272	1166	1.399634	9259	36
25	.699871	.714269	.979842	1.020572	1.400033	1.428834	35
26	.700079	4066	.980413	1.019979	0432	8410	34
27	0287	3862	0983	9385	0831	7987	33
28	0494	3658	1554	8792	1231	7564	32
29	0702	3454	2126	8200	1631	7141	31
30	.700909	.713250	2697	1.017607	1.402032	1.426718	30
31	1117	3047	3269	7015	2433	6296	29
32	1324	2843	3842	6424	2834	5874	28
33	1531	2639	4414	5833	3236	5453	27
34	1739	2434	4987	5242	3638	5032	26
35	.701946	.712230	.985560	1.014651	1.404040	1.424611	25
36	2153	2026	6134	4061	4443	4191	24
37	2360	1822	6708	3471	4846	3771	23
38	2567	1617	7282	2882	5249	3351	22
39	2774	1413	7857	2293	5653	2932	21
40	.702981	.711209	.988432	1.011704	1.406057	1.422513	20
41	3188	1004	9007	1115	6462	2095	19
42	3395	0799	.989582	1.010527	6867	1677	18
43	3601	0595	.990158	1.009939	7272	1259	17
44	3808	0390	0735	9352	7677	0842	16
45	.704015	.710185	.991311	1.008765	1.408083	1.420425	15
46	4221	.709981	1888	8178	8489	1.420008	14
47	4428	9776	2465	7592	8896	1.419592	13
48	4634	9571	3043	7006	9303	9176	12
49	4841	9366	3621	6420	1.409710	8761	11
50	.705047	.709161	.994199	1.005835	1.410118	1.418345	10
51	5253	8956	4778	5250	0526	7931	9
52	5459	8750	5357	4665	0934	7516	8
53	5665	8545	5936	4081	1343	7102	7
54	5872	8340	6515	.3497	1752	6688	6
55	.706078	.708134	.997095	1.002913	1.412161	1.416275	5
56	6284	7929	7676	2330	2571	5862	4
57	6489	7724	8256	1747	2981	5449	3
58	6695	7518	8837	1164	3392	5037	2
59	6901	7312	.999418	0582	3802	4625	1
60	.707107	.707107	1.000000	1.000000	1.414214	1.414214	0
′	Cosine	Sine	Cotan.	Tan.	Cosec.	Sec.	′

134° 45°

Table VII.—Corresponding Values of Degrees, Minutes, Seconds, Radians, and Hundredths of Degrees

Degrees						Minutes			Seconds		
0°	0.00000 00	60°	1.04719 76	120°	2.09439 51	0′	0.00000 00	0′	0″	0.00000 00	
1	0.01745 33	61	1.06465 08	121	2.11184 84	1	0.00029 09	1	1	0.00000 48	
2	0.03490 66	62	1.08210 41	122	2.12930 17	2	0.00058 18	2	2	0.00000 97	
3	0.05235 99	63	1.09955 74	123	2.14675 50	3	0.00087 27	3	3	0.00001 45	
4	0.06981 32	64	1.11701 07	124	2.16420 83	4	0.00116 36	4	4	0.00001 94	
5	0.08726 65	65	1.13446 40	125	2.18166 16	5	0.00145 44	5	5	0.00002 42	
6	0.10471 98	66	1.15191 73	126	2.19911 49	6	0.00174 53	6	6	0.00002 91	
7	0.12217 30	67	1.16937 06	127	2.21656 82	7	0.00203 62	7	7	0.00003 39	
8	0.13962 63	68	1.18682 39	128	2.23402 14	8	0.00232 71	8	8	0.00003 88	
9	0.15707 96	69	1.20427 72	129	2.25147 47	9	0.00261 80	9	9	0.00004 36	
10	0.17453 29	70	1.22173 05	130	2.26892 80	10	0.00290 89	10	10	0.00004 85	
11	0.19198 62	71	1.23918 38	131	2.28638 13	11	0.00319 98	11	11	0.00005 33	
12	0.20943 95	72	1.25663 71	132	2.30383 46	12	0.00349 07	12	12	0.00005 82	
13	0.22689 28	73	1.27409 04	133	2.32128 79	13	0.00378 15	13	13	0.00006 30	
14	0.24434 61	74	1.29154 36	134	2.33874 12	14	0.00407 24	14	14	0.00006 79	
15	0.26179 94	75	1.30899 69	135	2.35619 45	15	0.00436 33	15	15	0.00007 27	
16	0.27925 27	76	1.32645 02	136	2.37364 78	16	0.00465 42	16	16	0.00007 76	
17	0.29670 60	77	1.34390 35	137	2.39110 11	17	0.00494 51	17	17	0.00008 24	
18	0.31415 93	78	1.36135 68	138	2.40855 44	18	0.00523 60	18	18	0.00008 73	
19	0.33161 26	79	1.37881 01	139	2.42600 77	19	0.00552 69	19	19	0.00009 21	
20	0.34906 59	80	1.39626 34	140	2.44346 10	20	0.00581 78	20	20	0.00009 70	
21	0.36651 91	81	1.41371 67	141	2.46091 42	21	0.00610 87	21	21	0.00010 18	
22	0.38397 24	82	1.43117 00	142	2.47836 75	22	0.00639 95	22	22	0.00010 67	
23	0.40142 57	83	1.44862 33	143	2.49582 08	23	0.00669 04	23	23	0.00011 15	
24	0.41887 90	84	1.46607 66	144	2.51327 41	24	0.00698 13	24	24	0.00011 64	
25	0.43633 23	85	1.48352 99	145	2.53072 74	25	0.00727 22	25	25	0.00012 12	
26	0.45378 56	86	1.50098 32	146	2.54818 07	26	0.00756 31	26	26	0.00012 61	
27	0.47123 89	87	1.51843 64	147	2.56563 40	27	0.00785 40	27	27	0.00013 09	
28	0.48869 22	88	1.53588 97	148	2.58308 73	28	0.00814 49	28	28	0.00013 57	
29	0.50614 55	89	1.55334 30	149	2.60054 06	29	0.00843 58	29	29	0.00014 06	
30	0.52359 88	90	1.57079 63	150	2.61799 39	30	0.00872 66	30	30	0.00014 54	
31	0.54105 21	91	1.58824 96	151	2.63544 72	31	0.00901 75	31	31	0.00015 03	
32	0.55850 54	92	1.60570 29	152	2.65290 05	32	0.00930 84	32	32	0.00015 51	
33	0.57595 87	93	1.62315 62	153	2.67035 38	33	0.00959 93	33	33	0.00016 00	
34	0.59341 19	94	1.64060 95	154	2.68780 70	34	0.00989 02	34	34	0.00016 48	
35	0.61086 52	95	1.65806 28	155	2.70526 03	35	0.01018 11	35	35	0.00016 97	
36	0.62831 85	96	1.67551 61	156	2.72271 36	36	0.01047 20	36	36	0.00017 45	
37	0.64577 18	97	1.69296 94	157	2.74016 69	37	0.01076 29	37	37	0.00017 94	
38	0.66322 51	98	1.71042 27	158	2.75762 02	38	0.01105 38	38	38	0.00018 42	
39	0.68067 84	99	1.72787 60	159	2.77507 35	39	0.01134 46	39	39	0.00018 91	
40	0.69813 17	100	1.74532 93	160	2.79252 68	40	0.01163 55	40	40	0.00019 39	
41	0.71558 50	101	1.76278 25	161	2.80998 01	41	0.01192 64	41	41	0.00019 88	
42	0.73303 83	102	1.78023 58	162	2.82743 34	42	0.01221 73	42	42	0.00020 36	
43	0.75049 16	103	1.79768 91	163	2.84488 67	43	0.01250 82	43	43	0.00020 85	
44	0.76794 49	104	1.81514 24	164	2.86234 00	44	0.01279 91	44	44	0.00021 33	
45	0.78539 82	105	1.83259 57	165	2.87979 33	45	0.01309 00	45	45	0.00021 82	
46	0.80285 15	106	1.85004 90	166	2.89724 66	46	0.01338 09	46	46	0.00022 30	
47	0.82030 47	107	1.86750 23	167	2.91469 99	47	0.01367 17	47	47	0.00022 79	
48	0.83775 80	108	1.88495 56	168	2.93215 31	48	0.01396 26	48	48	0.00023 27	
49	0.85521 13	109	1.90240 89	169	2.94960 64	49	0.01425 35	49	49	0.00023 76	
50	0.87266 46	110	1.91986 22	170	2.96705 97	50	0.01454 44	50	50	0.00024 24	
51	0.89011 79	111	1.93731 55	171	2.98451 30	51	0.01483 53	51	51	0.00024 73	
52	0.90757 12	112	1.95476 88	172	3.00196 63	52	0.01512 62	52	52	0.00025 21	
53	0.92502 45	113	1.97222 21	173	3.01941 96	53	0.01541 71	53	53	0.00025 70	
54	0.94247 78	114	1.98967 53	174	3.03687 29	54	0.01570 80	54	54	0.00026 18	
55	0.95993 11	115	2.00712 86	175	3.05432 62	55	0.01599 89	55	55	0.00026 66	
56	0.97738 44	116	2.02458 19	176	3.07177 95	56	0.01628 97	56	56	0.00027 15	
57	0.99483 77	117	2.04203 52	177	3.08923 28	57	0.01658 06	57	57	0.00027 63	
58	1.01229 10	118	2.05948 85	178	3.10668 61	58	0.01687 15	58	58	0.00028 12	
59	1.02974 43	119	2.07694 18	179	3.12413 94	59	0.01716 24	59	59	0.00028 60	
60	1.04719 76	120	2.09439 51	180	3.14159 27	60	0.01745 33	60	60	0.00029 09	

Degrees						Minutes			Seconds		

Radians	Degrees	Degrees, min., sec.	Radians	Degrees	Degrees, min., sec.
.00001	.000573	0° 0′ 2.1″	.01	.572958	34′ 22.6″
2	1146	4.1″	2	1.145916	1° 8′ 45.3″
3	1719	6.2″	3	1.718873	1° 43′ 7.9″
4	2292	8.3″	4	2.291831	2° 17′ 30.6″
.00005	.002865	0° 0′ 10.3″	.05	2.864789	2° 51′ 53.2″
6	3438	12.4″	6	3.437747	3° 26′ 15.9″
7	4011	14.4″	7	4.010705	4° 0′ 38.5″
8	4584	16.5″	8	4.583662	4° 35′ 1.2″
9	5157	18.6″	9	5.156620	5° 9′ 23.8″
.00010	.005730	0° 0′ 20.6″	.10	5.729578	5° 43′ 46.5″
2	11459	41.3″	.2	11.459156	11° 27′ 33.0″
3	17189	1′ 1.9″	.3	17.188734	17° 11′ 19.4″
4	22918	1′ 22.5″	.4	22.918312	22° 55′ 5.9″
.0005	.028648	0° 1′ 43.1″	.5	28.647890	28° 38′ 52.4″
6	34377	2′ 3.8″	.6	34.377468	34° 22′ 38.9″
7	40107	2′ 24.4″	.7	40.107046	40° 6′ 25.4″
8	45837	2′ 45.0″	.8	45.836624	45° 50′ 11.8″
9	51566	3′ 5.6″	.9	51.566202	51° 33′ 58.3″
.0010	.057296	0° 3′ 26.3″	1.0	57.295780	57° 17′ 44.8″
2	.114592	6′ 52.5″	2	114.591559	114° 35 29.6″
3	.171887	10′ 18.8″	3	171.887339	171° 53′ 14.4″
4	.229183	13′ 45.1″	4	229.183118	229° 10′ 59.2″
.005	.286479	0° 17′ 11.3″	5	286.478898	286° 28′ 44.0″
6	.343775	20′ 37.6″	6	343.774677	343° 46′ 28.8″
7	.401070	24′ 3.9″	7	401.070457	401° 4′ 13.6″
8	.458366	27′ 30.1″	8	458.366236	458° 21′ 58.4″
9	.515662	30′ 56.4″	9	515.662016	515° 39′ 43.3″

.1°	6′	.01°	36″	.001°	3.6″
.2	12′	.02	1′ 12″	.002	7.2″
.3	18′	.03	1′ 48″	.003	10.8″
.4	24′	.04	2′ 24″	.004	14.4″
.5	30′	.05	3′	.005	18.0″
.6	36′	.06	3′ 36″	.006	21.6″
.7	42′	.07	4′ 12″	.007	25.2″
.8	48′	.08	4′ 48″	.008	28.8″
.9	54′	.09	5′ 24″	.009	32.4″

1′	.0167°	13′	.2167°	25′	.4167°	37′	.6167°	49′	.8167°
2′	.0333	14′	.2333	26′	.4333	38′	.6333	50′	.8333
3′	.0500	15′	.2500	27′	.4500	39′	.6500	51′	.8500
4′	.0667	16′	.2667	28′	.4667	40′	.6667	52′	.8667
5′	.0833	17′	.2833	29′	.4833	41′	.6833	53′	.8833
6′	.1000	18′	.3000	30′	.5000	42′	.7000	54′	.9000
7′	.1167	19′	.3167	31′	.5167	43′	.7167	55′	.9167
8′	.1333	20′	.3333	32′	.5333	44′	.7333	56′	.9333
9′	.1500	21′	.3500	33′	.5500	45′	.7500	57′	.9500
10′	.1667	22′	.3667	34′	.5667	46′	.7667	58′	.9667
11′	.1833	23′	.3833	35′	.5833	47′	.7833	59′	.9833
12′	.2000	24′	.4000	36′	.6000	48′	.8000		
1″	.0003°	13″	.0036°	25″	.0069°	37″	.0103°	49″	.0136°
2″	.0006	14″	.0039	26″	.0072	38″	.0106	50″	.0139
3″	.0008	15″	.0042	27″	.0075	39″	.0108	51″	.0142
4″	.0011	16″	.0044	28″	.0078	40″	.0111	52″	.0144
5″	.0014	17″	.0047	29″	.0081	41″	.0114	53″	.0147
6″	.0017	18″	.0050	30″	.0083	42″	.0117	54″	.0150
7″	.0019	19″	.0053	31″	.0086	43″	.0119	55″	.0153
8″	.0022	20″	.0056	32″	.0089	44″	.0122	56″	.0156
9″	.0025	21″	.0058	33″	.0092	45″	.0125	57″	.0158
10″	.0028	22″	.0061	34″	.0094	46″	.0128	58″	.0161
11″	.0031	23″	.0064	35″	.0097	47″	.0131	59″	.0164
12″	.0033	24″	.0067	36″	.0100	48″	.0133		

TABLE VIII.—FUNCTIONS OF ANGLES IN RADIANS

Radians	sin	cos	tan	cot	log sin	log cos	log tan
.00	0	1.0000	0			10.00000	
.01	.0100	1.0000	.0100	99.9967	8.0000	10.0000	8.0000
.02	.0200	.9998	.0200	49.9933	.3010	9.9999	.3011
.03	.0300	.9996	.0300	33.3233	.4771	.9998	.4773
.04	.0400	.9992	.0400	24.9867	.6019	.9997	.6023
.05	.0500	.9988	.0500	19.9833	8.6988	9.9995	8.6993
.06	.0600	.9982	.0601	16.6467	.7779	.9992	.7787
.07	.0699	.9976	.0701	14.2624	.8447	.9989	.8458
.08	.0799	.9968	.0802	12.4733	.9026	.9986	.9040
.09	.0899	.9960	.0902	11.0811	.9537	.9982	.9554
.10	.0998	.9950	.1003	9.9666	8.9993	9.9978	9.0015
.11	.1098	.9940	.1104	9.0542	9.0405	.9974	.0431
.12	.1197	.9928	.1206	8.2933	.0781	.9969	.0813
.13	.1296	.9916	.1307	7.6489	.1127	.9963	.1164
.14	.1395	.9902	.1409	7.0961	.1447	.9957	.1490
.15	.1494	.9888	.1511	6.6166	9.1745	9.9951	9.1794
.16	.1593	.9872	.1614	6.1966	.2023	.9944	.2078
.17	.1692	.9856	.1717	5.8256	.2284	.9937	.2347
.18	.1790	.9838	.1820	5.4954	.2529	.9929	.2600
.19	.1889	.9820	.1923	5.1997	.2761	.9921	.2840
.20	.1987	.9801	.2027	4.9332	9.2981	9.9913	9.3069
.21	.2085	.9780	.2131	4.6917	.3190	.9904	.3287
.22	.2182	.9759	.2236	4.4719	.3389	.9894	.3495
.23	.2280	.9737	.2341	4.2709	.3579	.9884	.3695
.24	.2377	.9713	.2447	4.0864	.3760	.9874	.3887
.25	.2474	.9689	.2553	3.9163	9.3934	9.9863	9.4071
.26	.2571	.9664	.2660	3.7591	.4101	.9852	.4249
.27	.2667	.9638	.2768	3.6133	.4261	.9840	.4421
.28	.2764	.9611	.2876	3.4776	.4415	.9827	.4587
.29	.2860	.9582	.2984	3.3511	.4563	.9815	.4748
.30	.2955	.9553	.3093	3.2327	9.4706	9.9802	9.4904
.31	.3051	.9523	.3203	3.1218	.4844	.9788	.5056
.32	.3146	.9492	.3314	3.0176	.4977	.9774	.5203
.33	.3240	.9460	.3425	2.9195	.5106	.9759	.5347
.34	.3335	.9428	.3537	2.8270	.5231	.9744	.5487
.35	.3429	.9394	.3650	2.7395	9.5352	9.9728	9.5623
.36	.3523	.9359	.3764	2.6567	.5469	.9712	.5757
.37	.3616	.9323	.3879	2.5782	.5582	.9696	.5887
.38	.3709	.9287	.3994	2.5037	.5693	.9679	.6014
.39	.3802	.9249	.4111	2.4328	.5800	.9661	.6139
.40	.3894	.9211	.4228	2.3652	9.5904	9.9643	9.6261
.41	.3986	.9171	.4346	2.3008	.6005	.9624	.6381
.42	.4078	.9131	.4466	2.2393	.6104	.9605	.6499
.43	.4169	.9090	.4586	2.1804	.6200	.9585	.6615
.44	.4259	.9048	.4708	2.1241	.6293	.9565	.6728
.45	.4350	.9004	.4831	2.0702	9.6385	9.9545	.6840
.46	.4439	.8961	.4954	2.0184	.6473	.9523	.6950
.47	.4529	.8916	.5080	1.9686	.6560	.9502	.7058
.48	.4618	.8870	.5206	1.9208	.6644	.9479	.7165
.49	.4706	.8823	.5334	1.8748	.6727	.9456	.7270
.50	.4794	.8776	.5463	1.8305	9.6807	9.9433	9.7374
.51	.4882	.8727	.5594	1.7878	.6886	.9409	.7477
.52	.4969	.8678	.5726	1.7465	.6963	.9384	.7578
.53	.5055	.8628	.5859	1.7067	.7038	.9359	.7678
.54	.5141	.8577	.5994	1.6683	.7111	.9333	.7777

Radians	sin	cos	tan	cot	log sin	log cos	log tan
.55	.5227	.8525	.6131	1.6310	9.7182	9.9307	9.7875
.56	.5312	.8473	.6269	1.5940	.7252	.9280	.7972
.57	.5396	.8419	.6410	1.5601	.7321	.9253	.8068
.58	.5480	.8365	.6552	1.5263	.7388	.9224	.8164
.59	.5564	.8309	.6696	1.4935	.7454	.9196	.8258
.60	.5646	.8253	.6841	1.4617	9.7518	9.9166	9.8351
.61	.5729	.8196	.6989	1.4308	.7581	.9136	.8444
.62	.5810	.8139	.7139	1.4007	.7642	.9106	.8536
.63	.5891	.8080	.7291	1.3715	.7702	.9074	.8628
.64	.5972	.8021	.7445	1.3431	.7761	.9042	.8719
.65	.6052	.7961	.7602	1.3154	9.7819	9.9010	9.8809
.66	.6131	.7900	.7761	1.2885	.7875	.8976	.8899
.67	.6210	.7838	.7923	1.2622	.7931	.8942	.8989
.68	.6288	.7776	.8087	1.2366	.7985	.8907	.9078
.69	.6365	.7712	.8253	1.2116	.8038	.8872	.9166
.70	.6442	.7648	.8423	1.1872	9.8090	9.8836	9.9255
.71	.6518	.7584	.8595	1.1634	.8141	.8799	.9343
.72	.6594	.7518	.8771	1.1402	.8191	.8761	.9430
.73	.6669	.7452	.8949	1.1174	.8240	.8723	.9518
.74	.6743	.7385	.9131	1.0952	.8288	.8683	.9605
.75	.6816	.7317	.9316	1.0734	9.8336	9.8643	9.9692
.76	.6889	.7248	.9505	1.0521	.8382	.8602	.9779
.77	.6961	.7179	.9697	1.0313	.8427	.8561	.9866
.78	.7033	.7109	0.9893	1.0109	.8471	.8518	.9953
.79	.7104	.7038	1.0092	0.9908	.8515	.8475	0.0040
.80	.7174	.6967	1.0296	.9712	9.8557	9.8431	.0127
.81	.7243	.6895	1.0505	.9520	.8599	.8385	.0214
.82	.7311	.6822	1.0717	.9331	.8640	.8339	.0301
.83	.7379	.6749	1.0934	.9146	.8680	.8292	.0388
.84	.7446	.6675	1.1156	.8964	.8719	.8244	.0475
.85	.7513	.6600	1.1383	.8785	9.8758	9.8195	.0563
.86	.7578	.6524	1.1616	.8609	.8796	.8145	.0650
.87	.7643	.6448	1.1853	.8437	.8833	.8094	.0738
.88	.7707	.6372	1.2097	.8267	.8869	.8042	.0827
.89	.7771	.6294	1.2346	.8100	.8905	.7989	.0915
.90	.7833	.6216	1.2602	.7936	9.8939	9.7935	.1004
.91	.7895	.6137	1.2864	.7774	.8974	.7880	.1094
.92	.7956	.6058	1.3133	.7615	.9007	.7823	.1184
.93	.8016	.5978	1.3409	.7458	.9040	.7766	.1274
.94	.8076	.5898	1.3692	.7303	.9072	.7707	.1365
.95	.8134	.5817	1.3984	.7151	9.9103	9.7647	.1456
.96	.8192	.5735	1.4284	.7001	.9134	.7585	.1548
.97	.8249	.5653	1.4592	.6853	.9164	.7523	.1641
.98	.8305	.5570	1.4910	.6707	.9193	.7459	.1735
.99	.8360	.5487	1.5237	.6563	.9222	.7393	.1829
1.00	.8415	.5403	1.5574	.6421	9.9250	9.7326	.1924
1.01	.8468	.5319	1.5922	.6281	.9278	.7258	.2020
1.02	.8521	.5234	1.6281	.6142	.9305	.7188	.2117
1.03	.8573	.5148	1.6652	.6005	.9331	.7117	.2215
1.04	.8624	.5062	1.7036	.5870	.9357	.7043	.2314
1.05	.8674	.4976	1.7433	.5736	9.9382	9.6969	.2414
1.06	.8724	.4889	1.7844	.5604	.9407	.6892	.2515
1.07	.8772	.4801	1.8270	.5473	.9431	.6814	.2617
1.08	.8820	.4713	1.8712	.5344	.9454	.6733	.2721
1.09	.8866	.4625	1.9171	.5216	.9477	.6651	.2826

Radians	sin	cos	tan	cot	log sin	log cos	log tan
1.10	.8912	.4536	1.9648	.5090	9.9500	9.6567	.2933
1.11	.8957	.4447	2.0143	.4964	.9522	.6480	.3041
1.12	.9001	.4357	2.0660	.4840	.9543	.6392	.3151
1.13	.9044	.4267	2.1198	.4718	.9564	.6301	.3263
1.14	.9086	.4176	2.1759	.4596	.9584	.6208	.3376
1.15	.9128	.4085	2.2345	.4475	9.9604	9.6112	.3492
1.16	.9168	.3993	2.2958	.4356	.9623	.6013	.3609
1.17	.9208	.3902	2.3600	.4237	.9641	.5912	.3729
1.18	.9246	.3809	2.4273	.4120	.9660	.5808	.3851
1.19	.9284	.3717	2.4979	.4003	.9677	.5701	.3976
1.20	.9320	.3624	2.5722	.3888	9.9694	9.5591	.4103
1.21	.9356	.3530	2.6503	.3773	.9711	.5478	.4233
1.22	.9391	.3436	2.7328	.3659	.9727	.5361	.4366
1.23	.9425	.3342	2.8198	.3546	.9743	.5241	.4502
1.24	.9458	.3248	2.9119	.3434	.9758	.5116	.4642
1.25	.9490	.3153	3.0096	.3323	9.9773	9.4988	.4785
1.26	.9521	.3058	3.1133	.3212	.9787	.4855	.4932
1.27	.9551	.2963	3.2236	.3102	.9800	.4717	.5083
1.28	.9580	.2867	3.3413	.2993	.9814	.4575	.5239
1.29	.9608	.2771	3.4672	.2884	.9826	.4427	.5400
1.30	.9636	.2675	3.6021	.2776	9.9839	9.4273	.5566
1.31	.9662	.2579	3.7471	.2669	.9851	.4114	.5737
1.32	.9687	.2482	3.9033	.2562	.9862	.3948	.5914
1.33	.9711	.2385	4.0721	.2456	.9873	.3774	.6098
1.34	.9735	.2288	4.2556	.2350	.9883	.3594	.6290
1.35	.9757	.2190	4.4552	.2245	9.9893	9.3405	.6489
1.36	.9779	.2092	4.6734	.2140	.9903	.3206	.6696
1.37	.9799	.1994	4.9131	.2035	.9912	.2998	.6914
1.38	.9819	.1896	5.1774	.1931	.9920	.2779	.7141
1.39	.9837	.1798	5.4707	.1828	.9929	.2548	.7380
1.40	.9854	.1700	5.7979	.1725	9.9936	9.2304	.7633
1.41	.9871	.1601	6.1654	.1622	.9944	.2044	.7900
1.42	.9887	.1502	6.5811	.1519	.9950	.1767	.8183
1.43	.9901	.1403	7.0555	.1417	.9957	.1472	.8485
1.44	.9915	.1304	7.6018	.1315	.9963	.1154	.8809
1.45	.9927	.1205	8.2381	.1214	9.9969	9.0810	.9158
1.46	.9939	.1106	8.9886	.1113	.9973	.0436	.9537
1.47	.9949	.1006	9.8874	.1011	.9978	.0027	0.9951
1.48	.9959	.0907	10.9834	.0910	.9982	8.9575	1.0407
1.49	.9967	.0807	12.3499	.0810	.9986	.9069	.0917
1.50	.9975	.0707	14.1014	.0709	9.9989	8.8496	1.1493
1.51	.9982	.0608	16.4281	.0609	.9992	.7836	.2156
1.52	.9987	.0508	19.6695	.0508	.9994	.7056	.2938
1.53	.9992	.0408	24.4996	.0408	.9996	.6105	.3891
1.54	.9995	.0308	32.4611	.0308	.9998	.4884	.5114
1.55	.9998	.0208	48.0785	.0208	9.9999	8.3180	1.6820
1.56	.9999	.0108	92.6204	.0108	10.0000	8.0333	1.9667
1.57	1.0000	.0008	1255.7656	.0008	10.0000	6.9011	3.0989
1.58	1.0000	−.0092	−108.6492	−.0092	10.0000	7.9640n	2.0360n
1.59	.9998	−.0192	−52.0669	−.0192	9.9999	8.2834n	1.7166n
1.60	.9996	−.0292	−34.2325	−.0292	9.9998	8.4654n	1.5344n
1.61	.9992	−.0392	−25.4947	−.0392	.9997	.5932n	.4064n
1.62	.9988	−.0492	−20.3073	−.0492	.9995	.6918n	.3076n
1.63	.9982	−.0592	−16.8710	−.0593	.9992	.7721n	.2271n
1.64	.9976	−.0691	−14.4270	−.0693	.9990	.8398n	.1592n

Radians	sin	cos	tan	cot	log sin	log cos	log tan
1.65	.9969	−.0791	−12.5993	−.0794	9.9986	8.8983n	1.1003n
1.66	.9960	−.0891	−11.1806	−.0894	.9983	.9498n	.0485n
1.67	.9951	−.0990	−10.0472	−.0995	.9979	.9958n	1.0020n
1.68	.9940	−.1090	−9.1208	−.1096	.9974	.0374n	0.9600n
1.69	.9929	−.1189	−8.3492	−.1198	.9969	.0753n	.9216n
1.70	.9917	−.1288	−7.6966	−.1299	9.9964	9.1101n	.8863n
1.71	.9903	−.1388	−7.1373	−.1401	.9958	.1422n	.8535n
1.72	.9889	−.1487	−6.6524	−.1503	.9951	.1722n	.8230n
1.73	.9874	−.1585	−6.2281	−.1606	.9945	.2001n	.7944n
1.74	.9857	−.1684	−5.8535	−.1708	.9938	.2263n	.7674n
1.75	.9840	−.1782	−5.5204	−.1811	9.9930	9.2510n	.7420n
1.76	.9822	−.1881	−5.2221	−.1915	.9922	.2743n	.7178n
1.77	.9802	−.1979	−4.9534	−.2019	.9913	.2964n	.6949n
1.78	.9782	−.2077	−4.7101	−.2123	.9904	.3174n	.6730n
1.79	.9761	−.2175	−4.4887	−.2228	.9895	.3374n	.6521n
1.80	.9738	−.2272	−4.2862	−.2333	9.9885	9.3564n	.6321n
1.81	.9715	−.2369	−4.1005	−.2439	.9875	.3746n	.6128n
1.82	.9691	−.2466	−3.9294	−.2545	.9864	.3920n	.5943n
1.83	.9666	−.2563	−3.7712	−.2652	.9852	.4088n	.5765n
1.84	.9640	−.2660	−3.6245	−.2759	.9841	.4247n	.5597n
1.85	.9613	−.2756	−3.4881	−.2867	9.9828	9.4403n	.5426n
1.86	.9585	−.2852	−3.3608	−.2975	.9816	.4551n	.5265n
1.87	.9556	−.2948	−3.2419	−.3085	.9803	.4695n	.5108n
1.88	.9526	−.3043	−3.1304	−.2194	.9789	.4833n	.4956n
1.89	.9495	−.3138	−3.0257	−.3305	.9775	.4967n	.4808n
1.90	.9463	−.3233	−2.9271	−.3416	9.9760	9.5096n	.4664n
1.91	.9430	−.3327	−2.8341	−.3528	.9745	.5221n	.4524n
1.92	.9396	−.3421	−2.7463	−.3641	.9730	.5342n	.4387n
1.93	.9362	−.3515	−2.6632	−.3755	.9714	.5460n	.4254n
1.94	.9326	−.3609	−2.5843	−.3869	.9697	.5574n	.4123n
1.95	.9290	−.3702	−2.5095	−.3985	9.9680	9.5684n	.3996n
1.96	.9252	−.3795	−2.4383	−.4101	.9662	.5792n	.3871n
1.97	.9214	−.3887	−2.3705	−.4219	.9644	.5896n	.3748n
1.98	.9174	−.3979	−2.3058	−.4337	.9626	.5998n	.3628n
1.99	.9134	−.4070	−2.2426	−.4456	.9607	.6096n	.3510n
2.00	.9093	−.4161	−2.1850	−.4577	9.9587	9.6192n	.3395n
2.01	.9051	−.4252	−2.1285	−.4698	.9567	.6286n	.3281n
2.02	.9008	−.4342	−2.0744	−.4821	.9546	.6377n	.3169n
2.03	.8964	−.4432	−2.0224	−.4945	.9525	.6466n	.3059n
2.04	.8919	−.4522	−1.9725	−.5070	.9503	.6553n	.2950n
2.05	.8874	−.4611	−1.9246	−.5196	9.9481	9.6638n	.2843n
2.06	.8827	−.4699	−1.8784	−.5324	.9458	.6720n	.2738n
2.07	.8780	−.4787	−1.8340	−.5453	.9435	.6801n	.2634n
2.08	.8731	−.4875	−1.7911	−.5583	.9411	.6880n	.2531n
2.09	.8682	−.4962	−1.7498	−.5715	.9386	.6956n	.2430n
2.10	.8632	−.5048	−1.7097	−.5848	9.9361	9.7032n	.2330n
2.11	.8581	−.5135	−1.6713	−.5983	.9335	.7105n	.2230n
2.12	.8529	−.5220	−1.6340	−.6120	.9309	.7177n	.2132n
2.13	.8477	−.5305	−1.5979	−.6258	.9282	.7247n	.2035n
2.14	.8423	−.5390	−1.5629	−.6398	.9255	.7316n	.1939n
2.15	.8369	−.5474	−1.5290	−.6540	9.9227	9.7383n	.1844n
2.16	.8314	−.5557	−1.4961	−.6684	.9198	.7448n	.1750n
2.17	.8258	−.5640	−1.4642	−.6830	.9169	.7513n	.1656n
2.18	.8201	−.5722	−1.4332	−.6977	.9139	.7576n	.1563n
2.19	.8143	−.5804	−1.4031	−.7127	.9108	.7638n	.1470n

Radians	sin	cos	tan	cot	log sin	log cos	log tan
2.20	.8085	−.5885	−1.3738	−.7279	9.9077	9.7697n	.1379n
2.21	.8026	−.5966	−1.3453	−.7433	.9045	.7757n	.1288n
2.22	.7967	−.6046	−1.3176	−.7589	.9012	.7814n	.1198n
2.23	.7905	−.6125	−1.2906	−.7748	.8979	.7871n	.1108n
2.24	.7843	−.6204	−1.2643	−.7910	.8945	.7926n	.1018n
2.25	.7781	−.6282	−1.2386	−.8073	9.8910	9.7981n	.0929n
2.26	.7718	−.6359	−1.2136	−.8240	.8875	.8034n	.0841n
2.27	.7654	−.6436	−1.1892	−.8409	.8839	.8086n	.0752n
2.28	.7589	−.6512	−1.1653	−.8581	.8802	.8137n	.0664n
2.29	.7523	−.6588	−1.1420	−.8757	.8764	.8187n	.0577n
2.30	.7457	−.6663	−1.1192	−.8935	9.8726	9.8237n	.0489n
2.31	.7390	−.6737	−1.0969	−.9117	.8686	.8285n	.0402n
2.32	.7322	−.6811	−1.0751	−.9301	.8646	.8332n	.0315n
2.33	.7254	−.6883	−1.0538	−.9489	.8606	.8378n	.0228n
2.34	.7185	−.6956	−1.0329	−.9681	.8564	.8423n	.0141n
2.35	.7115	−.7027	−1.0125	−.9877	9.8522	9.8468n	0.0054n
2.36	.7044	−.7098	−.9924	−1.0076	.8478	.8511n	9.9967n
2.37	.6973	−.7168	−.9728	−1.0280	.8434	.8554n	.9880n
2.38	.6901	−.7237	−.9535	−1.0488	.8389	.8596n	.9793n
2.39	.6828	−.7306	−.9346	−1.0700	.8343	.8637n	.9706n
2.40	.6755	−.7374	−.9160	−1.0917	9.8296	9.8677n	9.9619n
2.41	.6681	−.7441	−.8978	−1.1138	.8248	.8716n	.9532n
2.42	.6606	−.7508	−.8799	−1.1365	.8199	.8755n	.9444n
2.43	.6530	−.7573	−.8623	−1.1597	.8149	.8793n	.9357n
2.44	.6454	−.7638	−.8450	−1.1834	.8099	.8830n	.9269n
2.45	.6378	−.7702	−.8280	−1.2077	9.8047	9.8866n	9.9180n
2.46	.6300	−.7766	−.8113	−1.2326	.7994	.8902n	.9092n
2.47	.6222	−.7828	−.7948	−1.2581	.7940	.8937n	.9003n
2.48	.6144	−.7890	−.7787	−1.2843	.7884	.8971n	.8913n
2.49	.6065	−.7951	−.7627	−1.3101	.7828	.9004n	.8824n
2.50	.5985	−.8011	−.7470	−1.3386	9.7770	9.9037n	9.8733n
2.51	.5904	−.8071	−.7316	−1.3669	.7712	.9069n	.8642n
2.52	.5823	−.8130	−.7163	−1.3960	.7652	.9101n	.8551n
2.53	.5742	−.8187	−.7013	−1.4259	.7590	.9131n	.8459n
2.54	.5660	−.8244	−.6865	−1.4567	.7528	.9162n	.8366n
2.55	.5577	−.8301	−.6719	−1.4884	9.7464	9.9191n	9.8273n
2.56	.5494	−.8356	−.6574	−1.5210	.7399	.9220n	.8179n
2.57	.5410	−.8410	−.6432	−1.5547	.7332	.9248n	.8084n
2.58	.5325	−.8464	−.6292	−1.5894	.7263	.9276n	.7988n
2.59	.5240	−.8517	−.6153	−1.6252	.7194	.9303n	.7891n
2.60	.5155	−.8569	−.6016	−1.6622	9.7122	9.9329n	9.7793n
2.61	.5069	−.8620	−.5881	−1.7005	.7049	.9355n	.7694n
2.62	.4983	−.8670	−.5747	−1.7401	.6975	.9380n	.7594n
2.63	.4896	−.8720	−.5615	−1.7811	.6898	.9405n	.7493n
2.64	.4808	−.8768	−.5484	−1.8236	.6820	.9429n	.7391n
2.65	.4720	−.8816	−.5354	−1.8676	9.6740	9.9453n	9.7287n
2.66	.4632	−.8863	−.5226	−1.9134	.6658	.9476n	.7182n
2.67	.4543	−.8908	−.5100	−1.9609	.6573	.9498n	.7075n
2.68	.4454	−.8953	−.4974	−2.0103	.6487	.9520n	.6967n
2.69	.4364	−.8998	−.4850	−2.0618	.6399	.9541n	.6858n
2.70	.4274	−.9041	−.4727	−2.1154	9.6308	9.9562n	9.6746n
2.71	.4183	−.9083	−.4606	−2.1713	.6215	.9582n	.6633n
2.72	.4092	−.9124	−.4485	−2.2297	.6119	.9602n	.6517n
2.73	.4001	−.9165	−.4365	−2.2918	.6021	.9621n	.6400n
2.74	.3909	−.9204	−.4247	−2.3548	.5920	.9640n	.6281n

Radians	sin	cos	tan	cot	log sin	log cos	log tan
2.75	.3817	−.9243	−.4129	−2.4218	9.5817	9.9658n	9.6159n
2.76	.3724	−.9281	−.4013	−2.4921	.5710	.9676n	.6034n
2.77	.3631	−.9318	−.3897	−2.5661	.5600	.9693n	.5907n
2.78	.3538	−.9353	−.3782	−2.6439	.5487	.9710n	.5777n
2.79	.3444	−.9388	−.3668	−2.7260	.5371	.9726n	.5645n
2.80	.3350	−.9422	−.3555	−2.8107	9.5250	9.9742n	9.5509n
2.81	.3255	−.9455	−.3443	−2.9044	.5126	.9757n	.5369n
2.82	.3161	−.9487	−.3332	−3.0016	.4998	.9771n	.5227n
2.83	.3066	−.9518	−.3221	−3.1048	.4865	.9786n	.5080n
2.84	.2970	−.9549	−.3111	−3.2146	.4728	.9799n	.4929n
2.85	.2875	−.9578	−.3001	−3.3317	9.4586	9.9813n	9.4773n
2.86	.2779	−.9606	−.2893	−3.4569	.4439	.9826n	.4613n
2.87	.2683	−.9633	−.2785	−3.5910	.4286	.9838n	.4448n
2.88	.2586	−.9660	−.2677	−3.7351	.4127	.9850n	.4277n
2.89	.2489	−.9685	−.2570	−3.8904	.3961	.9861n	.4100n
2.90	.2392	−.9710	−.2464	−4.0583	9.3789	9.9872n	9.3917n
2.91	.2295	−.9733	−.2358	−4.2404	.3608	.9882n	.3726n
2.92	.2198	−.9755	−.2253	−4.4387	.3420	.9892n	.3527n
2.93	.2100	−.9777	−.2148	−4.6553	.3223	.9902n	.3321n
2.94	.2002	−.9797	−.2044	−4.8931	.3015	.9911n	.3104n
2.95	.1904	−.9817	−.1940	−5.1554	9.2797	9.9920n	9.2877n
2.96	.1806	−.9836	−.1836	−5.4462	.2567	.9928n	.2639n
2.97	.1708	−.9853	−.1733	−5.7704	.2324	.9936n	.2388n
2.98	.1609	−.9870	−.1630	−6.1344	.2065	.9943n	.2122n
2.99	.1510	−.9885	−.1528	−6.5460	.1760	.9950n	.1840n
3.00	.1411	−.9900	−.1425	−7.0152	9.1496	9.9956n	9.1540n
3.01	.1312	−.9913	−.1324	−7.5553	.1180	.9962n	.1218n
3.02	.1213	−.9926	−.1222	−8.1836	.0838	.9968n	.0871n
3.03	.1114	−.9938	−.1121	−8.9239	.0467	.9973n	.0494n
3.04	.1014	−.9948	−.1019	−9.8093	9.0061	.9978n	9.0084n
3.05	.0915	−.9958	−.0918	−10.8874	8.9613	9.9982n	8.9631n
3.06	.0815	−.9967	−.0818	−12.2288	.9112	.9986n	.9126n
3.07	.0715	−.9974	−.0717	−13.9440	.8545	.9989n	.8556n
3.08	.0616	−.9981	−.0617	−16.2152	.7893	.9992n	.7901n
3.09	.0516	−.9987	−.0516	−19.3654	.7124	.9994n	.7130n
3.10	.0416	−.9991	−.0416	−24.0288	8.6189	9.9996n	8.6193n
3.11	.0316	−.9995	−.0316	−31.6424	.4995	.9998n	.4997n
3.12	.0216	−.9998	−.0216	−46.3049	.3343	9.9999n	.3344n
3.13	.0116	−.9999	−.0116	−86.2578	8.0642	10.0000n	8.0642n
3.14	.0016	−1.0000	−.0016	−627.8825	7.2021	10.0000n	7.2021n
3.15	−.0084	−1.0000	.0084	118.9408	7.9247	10.0000n	7.9247
3.16	−.0184	−.9998	.0184	54.3200	8.2650n	9.9999n	8.2650
3.17	−.0284	−.9996	.0284	35.1927	.4535n	.9998n	.4536
3.18	−.0384	−.9993	.0384	26.0239	.5843n	.9997n	.5846
3.19	−.0484	−.9988	.0484	20.6419	.6847n	.9995n	.6853
3.20	−.0584	−.9983	.0585	15.1017	8.7662n	9.9993n	8.7670

TABLE IX.—LOGARITHMS OF FACTORIALS

x	$\log x!$	$x!$	$\log x!$
1	0	51	66.190645
2	.301030	52	67.906648
3	.778151	53	69.630924
4	1.380211	54	71.363318
5	2.079181	55	73.103681
6	2.857332	56	74.851869
7	3.702431	57	76.607744
8	4.605521	58	78.371172
9	5.559763	59	80.142024
10	6.559763	60	81.920175
11	7.601156	61	83.705505
12	8.680337	62	85.497896
13	9.794280	63	87.297237
14	10.940408	64	89.103417
15	12.116500	65	90.916330
16	13.320620	66	92.735874
17	14.551069	67	94.561949
18	15.806341	68	96.394458
19	17.085095	69	98.233307
20	18.386125	70	100.078405
21	19.708344	71	101.929663
22	21.050767	72	103.786996
23	22.412494	73	105.650319
24	23.792706	74	107.519550
25	25.190646	75	109.394612
26	26.605619	76	111.275425
27	28.036983	77	113.161916
28	29.484141	78	115.054011
29	30.946539	79	116.951638
30	32.423660	80	118.854728
31	33.915022	81	120.763213
32	35.420172	82	122.677027
33	36.938686	83	124.596105
34	38.470165	84	126.520384
35	40.014233	85	128.449803
36	41.570535	86	130.384301
37	43.138737	87	132.323821
38	44.718520	88	134.268303
39	46.309585	89	136.217693
40	47.911645	90	138.171936
41	49.524429	91	140.130977
42	51.147678	92	142.094765
43	52.781147	93	144.063248
44	54.424599	94	146.036376
45	56.077812	95	148.014099
46	57.740570	96	149.996371
47	59.412668	97	151.983142
48	61.093909	98	153.974368
49	62.784105	99	155.970004
50	64.483075	100	157.970004

For numbers larger than 100, Stirling's Theorem is quite useful and the results are sufficiently accurate for all ordinary computations. This formula is as follows:

$$n! \cong \sqrt{2\pi n}\left(\frac{n}{e}\right)^n$$

TABLE X.—NATURAL (OR NAPERIAN) LOGARITHMS OF NUMBERS

The following pages give the natural logarithms of numbers between 0.1 and 10, correct to six places. Moving the decimal point n places to the right in the number, *i.e.*, multiplying the number by 10^n, requires the addition of n times 2.302585 to the logarithm; values are given in the columns to the right. Since the numbers in the first two pages are less than 1, the logarithms are all negative; the printed logarithms should be followed by (-10). The base is $e = 2.718282$.

$\log_e x = \log_e 10 \log_{10} x = 2.302585 \log_{10} x$
$\log_{10} x = \log_{10} e \log_e x = 0.434294 \log_e x$

n	$n(2.302585)$	$n(7.697415-10)$
1	2.302585	7.697415−10
2	4.605170	5.394830−10
3	6.907755	3.092245−10
4	9.210340	0.789660−10
5	11.512925	8.487075−20
6	13.815511	6.184489−20
7	16.118096	3.881904−20
8	18.420681	1.579319−20
9	20.723266	9.276734−30

x	0	1	2	3	4	5	6	7	8	9
0.01	5.394830	490140	577151	657194	731302	800295	864833	925458	982616	036684
2	6.087977	136767	183287	227739	270299	311121	350341	388082	424449	459541
3	493442	526232	557981	588752	618605	647593	675764	703163	729831	755806
4	781124	805817	829914	853445	876434	898907	920886	942392	963446	984065
5	7.004268	024070	043488	062537	081229	099578	117596	135296	152688	169782
6	186589	203119	219379	235379	251128	266632	281899	296937	311752	326351
7	340740	354925	368911	382704	396310	409733	422978	436050	448954	461693
8	474271	486694	498964	511085	523062	534896	546592	558153	569582	580881
9	592054	603104	614033	624844	635540	646122	656593	666956	677212	687365
0.10	7.697415	707365	717218	726974	736636	746205	755684	765074	774376	783593
1	792725	801775	810744	819633	828443	837177	845835	854419	862929	871368
2	879736	888035	896266	904429	912526	920558	928527	936432	944275	952057
3	959779	967442	975047	982594	990085	997519	004900	012226	019498	026719
4	8.033887	041005	048072	055089	062058	068978	075851	082677	089457	096191
5	102880	109525	116125	122683	129197	135670	142101	148491	154840	161149
6	167419	173649	179841	185995	192111	198190	204233	210239	216209	222143
7	228043	233908	239739	245536	251300	257031	262729	268394	274028	279631
8	285202	290742	296251	301731	307180	312601	317991	323353	328687	333992
9	339269	344518	349740	354935	360103	365244	370359	375448	380512	385550
0.20	8.390562	395550	400512	405451	410365	415255	420121	424964	429783	434579
1	439352	444103	448831	453537	458221	462883	467523	472142	476740	481316
2	485872	490407	494922	499416	503891	508345	512780	517195	521590	525967
3	530324	534662	538982	543283	547566	551830	556077	560305	564515	568708
4	572884	577042	581182	585306	589413	593503	597576	601633	605673	609698
5	613706	617698	621674	625634	629579	633508	637422	641321	645204	649073
6	652926	656765	660589	664399	668194	671975	675741	679493	683232	686956
7	690667	694364	698047	701717	705373	709016	712646	716262	719866	723457
8	727034	730599	734152	737692	741219	744734	748237	751727	755205	758671
9	762126	765568	768999	772417	775824	779220	782604	785977	789338	792688
0.30	8.796027	799355	802672	805978	809272	812556	815830	819092	822345	825586
1	828817	832038	835248	838448	841638	844817	847987	851146	854296	857436
2	860566	863686	866796	869897	872988	876070	879142	882205	885258	888302
3	891337	894363	897380	900387	903386	906375	909356	912328	915291	918245
4	921190	924127	927055	929975	932886	935789	938683	941570	944447	947317
5	950178	953031	955876	958713	961542	964363	967175	969981	972778	975567
6	978349	981123	983889	986648	989399	992142	994878	997607	000328	003041
7	9.005748	008447	011139	013823	016501	019171	021834	024490	027139	029781
8	032416	035044	037665	040280	042887	045488	048082	050669	053250	055824
9	058391	060952	063507	066054	068596	071130	073659	076181	078697	081206

x	0	1	2	3	4	5	6	7	8	9
0.40	9.083709	086206	088697	091181	093660	096132	098598	101058	103512	105960
1	108402	110838	113268	115692	118111	120523	122930	125331	127726	130116
2	132499	134878	137250	139617	141978	144334	146684	149029	151368	153702
3	156030	158353	160670	162982	165289	167591	169887	172178	174464	176744
4	179019	181290	183555	185814	188069	190319	192564	194803	197038	199268
5	201492	203712	205927	208137	210342	212542	214738	216928	219114	221295
6	223471	225643	227810	229972	232129	234282	236430	238574	240713	242847
7	244977	247103	249224	251340	253452	255560	257663	259761	261855	263945
8	266031	268112	270189	272261	274330	276394	278453	280509	282560	284607
9	286650	288689	290723	292754	294780	296802	298821	300835	302845	304851
0.50	9.306853	08851	10845	12835	14821	16803	18781	20756	22726	24693
1	26655	28614	30569	32521	34468	36412	38351	40288	42220	44149
2	46074	47995	49912	51826	53736	55643	57546	59445	61341	63233
3	65122	67007	68888	70766	72641	74511	76379	78243	80103	81960
4	83814	85664	87511	89354	91194	93031	94864	96694	98520	00343
5	402163	03980	05793	07603	09409	11213	13013	14810	16604	18394
6	20182	21966	23747	25524	27299	29070	30839	32604	34366	36125
7	37881	39634	41384	43130	44874	46615	48352	50087	51819	53547
8	55273	56995	58715	60432	62146	63857	65565	67270	68972	70671
9	72367	74061	75751	77439	79124	80806	82485	84162	85835	87506
0.60	9.489174	90840	92502	94162	95819	97473	99125	00774	02420	04063
1	505704	07342	08977	10610	12240	13867	15492	17114	18733	20350
2	21964	23576	25185	26791	28395	29996	31595	33191	34785	36376
3	37965	39551	41134	42715	44294	45870	47443	49014	50583	52149
4	53713	55274	56833	58389	59943	61495	63044	64591	66135	67677
5	69217	70754	72289	73822	75352	76880	78406	79929	81450	82968
6	84485	85999	87510	89020	90527	92032	93534	95035	96533	98029
7	99522	01014	02503	03990	05475	06957	08438	09916	11392	12866
8	614338	15807	17274	18740	20203	21664	23122	24579	26034	27486
9	28936	30385	31831	33275	34717	36157	37594	39030	40464	41895
0.70	9.643325	44753	46178	47602	49023	50443	51860	53275	54689	56100
1	57510	58917	60323	61726	63128	64527	65925	67321	68714	70106
2	71496	72884	74270	75654	77036	78416	79795	81171	82546	83918
3	85289	86658	88025	89390	90754	92115	93475	94833	96189	97543
4	98895	00245	01594	02941	04286	05629	06970	08310	09648	10984
5	12318	13650	14981	16310	17637	18962	20286	21608	22928	24246
6	25563	26878	28191	29503	30813	32121	33427	34732	36034	37336
7	38635	39933	41229	42524	43817	45108	46397	47685	48971	50256
8	51539	52820	54099	55377	56654	57928	59202	60473	61743	63011
9	64278	65543	66806	68068	69328	70587	71844	73099	74353	75606
0.80	9.776856	78106	79353	80599	81844	83087	84328	85568	86807	88044
1	89279	90513	91745	92976	94205	95433	96659	97884	99107	00329
2	801549	02768	03985	05201	06415	07628	08839	10049	11258	12465
3	13670	14875	16077	17278	18478	19676	20873	22069	23263	24455
4	25647	26836	28025	29212	30397	31581	32764	33945	35125	36304
5	37481	38657	39831	41004	42176	43346	44515	45683	46849	48014
6	49177	50339	51500	52659	53817	54974	56130	57284	58436	59588
7	60738	61887	63034	64180	65325	66469	67611	68752	69891	71030
8	72167	73302	74437	75570	76702	77832	78962	80090	81216	82342
9	83466	84589	85711	86831	87950	89068	90185	91301	92415	93528

x	0	1	2	3	4	5	6	7	8	9
0.90	9.894639	95750	96859	97967	99074	00180	01284	02387	03489	04590
1	905689	06788	07885	08981	10075	11169	12261	13352	14442	15531
2	16618	17705	18790	19874	20957	22038	23119	24198	25276	26353
3	27429	28504	29578	30650	31721	32791	33860	34928	35995	37060
4	38125	39188	40250	41311	42371	43430	44487	45544	46599	47654
5	48707	49759	50810	51860	52908	53956	55003	56048	57092	58136
6	59178	60219	61259	62298	63336	64373	65409	66443	67477	68509
7	69541	70571	71601	72629	73656	74682	75707	76731	77754	78776
8	79797	80817	81836	82854	83871	84886	85901	86915	87927	88939
9	89950	90959	91968	92975	93982	94987	95992	96995	97998	98999
1.00	0.000000	01000	01998	02996	03992	04988	05982	06976	07968	08960
1	09950	10940	11929	12916	13903	14889	15873	16857	17840	18822
2	19803	20783	21761	22739	23717	24693	25668	26642	27615	28587
3	29559	30529	31499	32467	33435	34401	35367	36332	37296	38259
4	39221	40182	41142	42101	43059	44017	44973	45929	46884	47837
5	48790	49742	50693	51643	52592	53541	54488	55435	56380	57325
6	58269	59212	60154	61095	62035	62975	63913	64851	65788	66724
7	67659	68593	69526	70458	71390	72321	73250	74179	75107	76035
8	76961	77887	78811	79735	80658	81580	82501	83422	84341	85260
9	86178	87095	88011	88926	89841	90754	91667	92579	93490	94401
1.10	0.095310	96219	97127	98034	98940	99845	00750	01654	02557	03459
1	104360	05261	06160	07059	07957	08854	09751	10647	11541	12435
2	13329	14221	15113	16004	16894	17783	18672	19559	20446	21332
3	22218	23102	23986	24869	25751	26633	27513	28393	29272	30151
4	31028	31905	32781	33656	34531	35405	36278	37150	38021	38892
5	39762	40631	41500	42367	43234	44100	44966	45830	46694	47558
6	48420	49282	50143	51003	51862	52721	53579	54436	55293	56149
7	57004	57858	58712	59565	60417	61268	62119	62969	63818	64667
8	65514	66362	67208	68054	68899	69743	70586	71429	72271	73113
9	73953	74793	75633	76471	77309	78146	78983	79818	80653	81488
1.20	0.182322	83155	83987	84818	85649	86480	87309	88138	88966	89794
1	90620	91446	92272	93097	93921	94744	95567	96389	97210	98031
2	98851	99670	00489	01307	02124	02941	03757	04572	05387	06201
3	207014	07827	08639	09450	10261	11071	11880	12689	13497	14305
4	15111	15918	16723	17528	18332	19136	19938	20741	21542	22343
5	23144	23943	24742	25541	26338	27136	27932	28728	29523	30318
6	31112	31905	32698	33490	34281	35072	35862	36652	37441	38229
7	39017	39804	40590	41376	42162	42946	43730	44514	45296	46079
8	46860	47641	48421	49201	49980	50759	51537	52314	53091	53867
9	54642	55417	56191	56965	57738	58511	59283	60054	60825	61595
1.30	0.262364	63133	63902	64669	65436	66203	66969	67734	68499	69263
1	70027	70790	71553	72315	73076	73837	74597	75356	76115	76874
2	77632	78389	79146	79902	80657	81412	82167	82921	83674	84427
3	85179	85931	86682	87432	88182	88931	89680	90428	91176	91923
4	92670	93416	94161	94906	95650	96394	97137	97880	98622	99364
5	300105	00845	01585	02324	03063	03801	04539	05276	06013	06749
6	07485	08220	08954	09688	10422	11154	11887	12619	13350	14081
7	14811	15540	16270	16998	17726	18454	19181	19907	20633	21359
8	22083	22808	23532	24255	24978	25700	26422	27143	27864	28584
9	29304	30023	30742	31460	32177	32894	33611	34327	35043	35758

x	0	1	2	3	4	5	6	7	8	9
1.40	0.336472	37186	37900	38613	39325	40037	40749	41460	42170	42880
1	43590	44299	45007	45715	46423	47130	47836	48542	49247	49952
2	50657	51361	52064	52767	53470	54172	54873	55574	56275	56975
3	57674	58374	59072	59770	60468	61165	61861	62558	63253	63948
4	64643	65337	66031	66724	67417	68109	68801	69492	70183	70874
5	71564	72253	72942	73630	74318	75006	75693	76380	77066	77751
6	78436	79121	79805	80489	81172	81855	82538	83219	83901	84582
7	85262	85942	86622	87301	87980	88658	89336	90013	90690	91366
8	92042	92718	93393	94067	94741	95415	96088	96761	97433	98105
9	98776	99447	00118	00788	01457	02126	02795	03463	04131	04798
1.50	0.405465	06132	06798	07463	08128	08793	09457	10121	10784	11447
1	12110	12772	13433	14094	14755	15415	16075	16735	17394	18052
2	18710	19368	20025	20682	21338	21994	22650	23305	23960	24614
3	25268	25921	26574	27227	27879	28530	29182	29832	30483	31133
4	31782	32432	33080	33729	34376	35024	35671	36318	36964	37610
5	38255	38900	39544	40189	40832	41476	42118	42761	43403	44045
6	44686	45327	45967	46607	47247	47886	48525	49163	49801	50438
7	51076	51712	52349	52985	53620	54255	54890	55524	56158	56792
8	57425	58058	58690	59322	59953	60584	61215	61845	62475	63105
9	63734	64363	64991	65619	66247	66874	67500	68127	68753	69378
1.60	0.470004	70628	71253	71877	72501	73124	73747	74369	74991	75613
1	76234	76855	77476	78096	78716	79335	79954	80573	81191	81809
2	82426	83043	83660	84276	84892	85508	86123	86738	87352	87966
3	88580	89193	89806	90419	91031	91643	92254	92865	93476	94086
4	94696	95306	95915	96524	97132	97740	98348	98955	99562	00169
5	500775	01381	01987	02592	03197	03801	04405	05009	05612	06215
6	06818	07420	08022	08623	09224	09825	10426	11026	11625	12225
7	12824	13422	14021	14618	15216	15813	16410	17006	17603	18198
8	18794	19389	19984	20578	21172	21766	22359	22952	23544	24137
9	24729	25320	25911	26502	27093	27683	28273	28862	29451	30040
1.70	0.530628	31216	31804	32391	32978	33565	34151	34737	35323	35908
1	36493	37078	37662	38246	38830	39413	39996	40579	41161	41743
2	42324	42906	43486	44067	44647	45227	45807	46386	46965	47543
3	48121	48699	49277	49854	50431	51007	51584	52159	52735	53310
4	53885	54460	55034	55608	56181	56755	57327	57900	58472	59044
5	59616	60187	60758	61329	61899	62469	63038	63608	64177	64745
6	65314	65882	66450	67017	67584	68151	68717	69283	69849	70414
7	70980	71544	72109	72673	73237	73800	74364	74927	75489	76051
8	76613	77175	77736	78297	78858	79418	79978	80538	81098	81657
9	82216	82774	83332	83890	84448	85005	85562	86119	86675	87231
1.80	0.587787	88342	88897	89452	90006	90561	91114	91668	92221	92774
1	93327	93879	94431	94983	95534	96085	96636	97187	97737	98287
2	98837	99386	99935	00483	01032	01580	02128	02675	03222	03769
3	604316	04862	05408	05954	06499	07044	07589	08134	08678	09222
4	09766	10309	10852	11395	11937	12479	13021	13563	14104	14645
5	15186	15726	16266	16806	17345	17885	18424	18962	19501	20039
6	20576	21114	21651	22188	22725	23261	23797	24333	24868	25404
7	25938	26473	27007	27541	28075	28609	29142	29675	30207	30740
8	31272	31804	32335	32866	33397	33928	34458	34988	35518	36048
9	36577	37106	37634	38163	38691	39219	39746	40274	40801	41327

x	0	1	2	3	4	5	6	7	8	9
1.90	0.641854	42380	42906	43432	43957	44482	45007	45531	46056	46580
1	47103	47627	48150	48673	49195	49718	50240	50761	51283	51804
2	52325	52846	53366	53886	54406	54926	55445	55964	56483	57002
3	57520	58038	58556	59073	59590	60107	60624	61140	61657	62172
4	62688	63203	63718	64233	64748	65262	65776	66290	66803	67316
5	67829	68342	68854	69367	69879	70390	70902	71413	71924	72434
6	72944	73455	73964	74474	74983	75492	76001	76510	77018	77526
7	78034	78541	79048	79555	80062	80568	81075	81581	82086	82592
8	83097	83602	84106	84611	85115	85619	86123	86626	87129	87632
9	88135	88637	89139	89641	90143	90644	91145	91646	92147	92647
2.00	0.693147	93647	94147	94646	95145	95644	96143	96641	97139	97637
1	98135	98632	99129	99626	00123	00619	01115	01611	02107	02602
2	703098	03592	04087	04582	05076	05570	06063	06557	07050	07543
3	08036	08528	09021	09513	10004	10496	10987	11478	11969	12459
4	12950	13440	13930	14419	14909	15398	15887	16375	16864	17352
5	17840	18327	18815	19302	19789	20276	20762	21249	21735	22220
6	22706	23191	23676	24161	24646	25130	25614	26098	26582	27065
7	27549	28032	28514	28997	29479	29961	30443	30925	31406	31887
8	32368	32849	33329	33809	34289	34769	35248	35728	36207	36685
9	37164	37642	38121	38598	39076	39554	40031	40508	40985	41461
2.10	0.741937	42413	42889	43365	43840	44315	44790	45265	45740	46214
1	46688	47162	47635	48109	48582	49055	49528	50000	50472	50944
2	51416	51888	52359	52830	53301	53772	54242	54713	55183	55652
3	56122	56591	57061	57529	57998	58467	58935	59403	59871	60338
4	60806	61273	61740	62207	62673	63140	63606	64072	64537	65003
5	65468	65933	66398	66862	67327	67791	68255	68718	69182	69645
6	70108	70571	71034	71496	71958	72420	72882	73344	73805	74266
7	74727	75188	75648	76109	76569	77029	77488	77948	78407	78866
8	79325	79783	80242	80700	81158	81616	82073	82531	82988	83445
9	83902	84358	84814	85270	85726	86182	86638	87093	87548	88003
2.20	0.788457	88912	89366	89820	90274	90728	91181	91634	92087	92540
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2	97507	97958	98408	98858	99307	99757	00206	00655	01104	01553
3	802002	02450	02898	03346	03794	04241	04689	05136	05583	06029
4	06476	06922	07368	07814	08260	08706	09151	09596	10041	10486
5	10930	11375	11819	12263	12706	13150	13593	14036	14479	14922
6	15365	15807	16249	16691	17133	17575	18016	18457	18898	19339
7	19780	20220	20661	21101	21540	21980	22420	22859	23298	23737
8	24175	24614	25052	25490	25928	26366	26804	27241	27678	28115
9	28552	28988	29425	29861	30297	30733	31168	31604	32039	32474
2.30	0.832909	33344	33778	34213	34647	35081	35514	35948	36381	36815
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3	45868	46297	46726	47155	47584	48012	48440	48868	49296	49723
4	50151	50578	51005	51432	51859	52285	52712	53138	53564	53990
5	54415	54841	55266	55691	56116	56541	56965	57390	57814	58238
6	58662	59085	59509	59932	60355	60778	61201	61623	62046	62468
7	62890	63312	63733	64155	64576	64997	65418	65839	66260	66680
8	67100	67521	67940	68360	68780	69199	69618	70037	70456	70875
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3	87891	88303	88714	89125	89536	89947	90357	90768	91178	91588
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5	96088	96496	96904	97312	97719	98127	98534	98941	99348	99755
6	900161	00568	00974	01380	01786	02192	02597	03003	03408	03813
7	04218	04623	05028	05432	05836	06240	06644	07048	07452	07855
8	08259	08662	09065	09468	09870	10273	10675	11077	11479	11881
9	12283	12684	13086	13487	13888	14289	14689	15090	15490	15891
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3	28219	28614	29010	29404	29799	30194	30588	30982	31376	31770
4	32164	32558	32951	33344	33738	34131	34524	34916	35309	35701
5	36093	36485	36877	37269	37661	38052	38444	38835	39226	39617
6	40007	40398	40788	41178	41569	41958	42348	42738	43127	43517
7	43906	44295	44684	45073	45461	45850	46238	46626	47014	47402
8	47789	48177	48564	48952	49339	49726	50112	50499	50885	51272
9	51658	52044	52430	52816	53201	53587	53972	54357	54742	55127
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2	63174	63556	63937	64319	64700	65081	65462	65843	66223	66604
3	66984	67364	67744	68124	68504	68883	69263	69642	70021	70400
4	70779	71158	71536	71915	72293	72671	73049	73427	73805	74182
5	74560	74937	75314	75691	76068	76445	76821	77198	77574	77950
6	78326	78702	79078	79453	79829	80204	80579	80954	81329	81704
7	82078	82453	82827	83201	83575	83949	84323	84697	85070	85444
8	85817	86190	86563	86936	87308	87681	88053	88425	88797	89169
9	89541	89913	90284	90656	91027	91398	91769	92140	92511	92881
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3	04302	04668	05034	05400	05766	06131	06497	06862	07228	07593
4	07958	08323	08688	09052	09417	09781	10145	10509	10873	11237
5	11601	11964	12328	12691	13054	13417	13780	14143	14506	14868
6	15231	15593	15955	16317	16679	17041	17402	17764	18125	18486
7	18847	19208	19569	19930	20290	20651	21011	21371	21731	22091
8	22451	22811	23170	23529	23889	24248	24607	24966	25324	25683
9	26042	26400	26758	27116	27474	27832	28190	28547	28905	29262
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4	43804	44156	44508	44860	45212	45563	45914	46266	46617	46968
5	47319	47670	48021	48371	48722	49072	49422	49772	50122	50472
6	50822	51171	51521	51870	52219	52568	52917	53266	53615	53964
7	54312	54660	55009	55357	55705	56053	56400	56748	57096	57443
8	57790	58137	58484	58831	59178	59525	59871	60218	60564	60910
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3	75002	75344	75685	76026	76367	76707	77048	77389	77729	78069
4	78410	78750	79090	79429	79769	80109	80448	80788	81127	81466
5	81805	82144	82483	82822	83160	83499	83837	84175	84513	84851
6	85189	85527	85865	86202	86540	86877	87214	87551	87888	88225
7	88562	88899	89235	89572	89908	90244	90580	90916	91252	91588
8	91923	92259	92594	92930	93265	93600	93935	94270	94604	94939
9	95273	95608	95942	96276	96610	96944	97278	97612	97945	98279
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1	101940	02272	02604	02936	03268	03600	03931	04263	04594	04926
2	05257	05588	05919	06250	06580	06911	07242	07572	07902	08233
3	08563	08893	09222	09552	09882	10211	10541	10870	11199	11529
4	11858	12186	12515	12844	13172	13501	13829	14158	14486	14814
5	15142	15469	15797	16125	16452	16780	17107	17434	17761	18088
6	18415	18742	19068	19395	19721	20048	20374	20700	21026	21352
7	21678	22003	22329	22654	22980	23305	23630	23955	24280	24605
8	24930	25254	25579	25903	26227	26552	26876	27200	27524	27847
9	28171	28495	28818	29141	29465	29788	30111	30434	30757	31079
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1	34623	34944	35266	35587	35908	36229	36550	36871	37192	37512
2	37833	38153	38474	38794	39114	39434	39754	40074	40394	40713
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4	44223	44541	44860	45178	45496	45814	46132	46450	46767	47085
5	47402	47720	48037	48354	48671	48988	49305	49622	49939	50256
6	50572	50888	51205	51521	51837	52153	52469	52785	53100	53416
7	53732	54047	54362	54678	54993	55308	55623	55937	56252	56567
8	56881	57196	57510	57824	58138	58452	58766	59080	59394	59707
9	60021	60334	60648	60961	61274	61587	61900	62213	62526	62838
3.20	1.163151	63463	63776	64088	64400	64712	65024	65336	65648	65959
1	66271	66582	66894	67205	67516	67827	68138	68449	68760	69071
2	69381	69692	70002	70313	70623	70933	71243	71553	71863	72172
3	72482	72792	73101	73410	73720	74029	74338	74647	74956	75265
4	75573	75882	76190	76499	76807	77115	77423	77731	78039	78347
5	78655	78963	79270	79578	79885	80192	80499	80807	81114	81420
6	81727	82034	82341	82647	82953	83260	83566	83872	84178	84484
7	84790	85096	85401	85707	86012	86318	86623	86928	87233	87538
8	87843	88148	88453	88758	89062	89367	89671	89975	90279	90584
9	90888	91191	91495	91799	92103	92406	92710	93013	93316	93619
3.30	1.193922	94225	94528	94831	95134	95436	95739	96041	96344	96646
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2	99965	00266	00567	00868	01169	01470	01770	02071	02372	02672
3	202972	03273	03573	03873	04173	04473	04772	05072	05372	05671
4	05971	06270	06569	06869	07168	07467	07766	08064	08363	08662
5	08960	09259	09557	09855	10154	10452	10750	11048	11346	11643
6	11941	12239	12536	12833	13131	13428	13725	14022	14319	14616
7	14913	15209	15506	15803	16099	16395	16692	16988	17284	17580
8	17876	18172	18467	18763	19058	19354	19649	19945	20240	20535
9	20830	21125	21420	21714	22009	22304	22598	22893	23187	23481

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1	26712	27006	27299	27592	27885	28177	28470	28763	29056	29348
2	29641	29933	30225	30517	30809	31101	31393	31685	31977	32269
3	32560	32852	33143	33435	33726	34017	34308	34599	34890	35181
4	35471	35762	36053	36343	36634	36924	37214	37504	37794	38084
5	38374	38664	38954	39243	39533	39822	40112	40401	40690	40980
6	41269	41558	41846	42135	42424	42713	43001	43290	43578	43866
7	44155	44443	44731	45019	45307	45594	45882	46170	46457	46745
8	47032	47320	47607	47894	48181	48468	48755	49042	49329	49615
9	49902	50188	50475	50761	51047	51333	51619	51905	52191	52477
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1	55616	55901	56186	56470	56755	57040	57324	57608	57893	58177
2	58461	58745	59029	59313	59597	59880	60164	60448	60731	61015
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4	64127	64409	64692	64974	65256	65538	65820	66102	66384	66666
5	66948	67229	67511	67792	68074	68355	68636	68917	69199	69480
6	69761	70041	70322	70603	70884	71164	71445	71725	72005	72285
7	72566	72846	73126	73406	73685	73965	74245	74524	74804	75083
8	75363	75642	75921	76200	76479	76758	77037	77316	77595	77874
9	78152	78431	78709	78988	79266	79544	79822	80100	80378	80656
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2	86474	86750	87026	87302	87578	87854	88130	88406	88682	88957
3	89233	89508	89783	90059	90334	90609	90884	91159	91434	91709
4	91984	92258	92533	92808	93082	93356	93631	93905	94179	94453
5	94727	95001	95275	95549	95822	96096	96370	96643	96917	97190
6	97463	97736	98009	98282	98555	98828	99101	99374	99647	99919
7	300192	00464	00736	01009	01281	01553	01825	02097	02369	02641
8	02913	03184	03456	03728	03999	04271	04542	04813	05084	05355
9	05626	05897	06168	06439	06710	06981	07251	07522	07792	08063
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1	11032	11301	11571	11840	12109	12379	12648	12917	13186	13455
2	13724	13992	14261	14530	14798	15067	15335	15604	15872	16140
3	16408	16676	16944	17212	17480	17748	18016	18283	18551	18818
4	19086	19353	19620	19887	20155	20422	20689	20956	21222	21489
5	21756	22022	22289	22556	22822	23088	23355	23621	23887	24153
6	24419	24685	24951	25217	25482	25748	26013	26279	26544	26810
7	27075	27340	27605	27870	28135	28400	28665	28930	29195	29459
8	29724	29989	30253	30517	30782	31046	31310	31574	31838	32102
9	32366	32630	32894	33157	33421	33684	33948	34211	34475	34738
3.80	1.335001	35264	35527	35790	36053	36316	36579	36841	37104	37367
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6	50667	50926	51185	51444	51703	51962	52220	52479	52738	52996
7	53255	53513	53771	54029	54288	54546	54804	55062	55320	55577
8	55835	56093	56350	56608	56866	57123	57380	57638	57895	58152
9	58409	58666	58923	59180	59437	59694	59950	60207	60464	60720

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3	68639	68894	69148	69402	69657	69911	70165	70419	70673	70927
4	71181	71434	71688	71942	72195	72449	72702	72956	73209	73462
5	73716	73969	74222	74475	74728	74981	75233	75486	75739	75991
6	76244	76497	76749	77001	77254	77506	77758	78010	78262	78514
7	78766	79018	79270	79521	79773	80025	80276	80528	80779	81031
8	81282	81533	81784	82035	82286	82537	82788	83039	83290	83541
9	83791	84042	84292	84543	84793	85044	85294	85544	85794	86044
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2	91282	91531	91779	92028	92276	92525	92773	93022	93270	93518
3	93766	94014	94263	94511	94758	95006	95254	95502	95750	95997
4	96245	96492	96740	96987	97234	97482	97729	97976	98223	98470
5	98717	98964	99211	99457	99704	99951	00197	00444	00690	00937
6	401183	01429	01675	01922	02168	02414	02660	02906	03151	03397
7	03643	03889	04134	04380	04625	04871	05116	05361	05607	05852
8	06097	06342	06587	06832	07077	07322	07566	07811	08056	08300
9	08545	08789	09034	09278	09522	09767	10011	10255	10499	10743
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1	13423	13666	13910	14153	14396	14639	14882	15125	15368	15610
2	15853	16096	16338	16581	16824	17066	17308	17551	17793	18035
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4	20696	20937	21179	21420	21662	21903	22144	22385	22626	22867
5	23108	23349	23590	23831	24072	24312	24553	24794	25034	25275
6	25515	25755	25996	26236	26476	26716	26956	27196	27436	27676
7	27916	28156	28396	28635	28875	29114	29354	29593	29833	30072
8	30311	30550	30790	31029	31268	31507	31746	31984	32223	32462
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4.20	1.435085	35323	35561	35799	36036	36274	36512	36750	36987	37225
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2	39835	40072	40309	40546	40783	41019	41256	41493	41729	41966
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5	46919	47154	47389	47625	47860	48095	48330	48565	48800	49034
6	49269	49504	49739	49973	50208	50442	50677	50911	51145	51380
7	51614	51848	52082	52316	52550	52784	53018	53252	53486	53719
8	53953	54187	54420	54654	54887	55121	55354	55587	55820	56054
9	56287	56520	56753	56986	57219	57452	57684	57917	58150	58382
4.30	1.458615	58848	59080	59312	59545	59777	60009	60242	60474	60706
1	60938	61170	61402	61634	61866	62097	62329	62561	62792	63024
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3	65568	65798	66029	66260	66491	66722	66952	67183	67413	67644
4	67874	68105	68335	68565	68796	69026	69256	69486	69716	69946
5	70176	70406	70636	70865	71095	71325	71554	71784	72013	72243
6	72472	72701	72931	73160	73389	73618	73847	74076	74305	74534
7	74763	74992	75221	75449	75678	75907	76135	76364	76592	76820
8	77049	77277	77505	77733	77962	78190	78418	78646	78874	79101
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2	86140	86366	86592	86818	87044	87270	87496	87722	87948	88174
3	88400	88625	88851	89077	89302	89528	89753	89978	90204	90429
4	90654	90880	91105	91330	91555	91780	92005	92230	92455	92679
5	92904	93129	93353	93578	93803	94027	94252	94476	94700	94925
6	95149	95373	95597	95821	96045	96269	96493	96717	96941	97165
7	97388	97612	97836	98059	98283	98506	98730	98953	99177	99400
8	99623	99846	00069	00292	00516	00738	00961	01184	01407	01630
9	501853	02075	02298	02521	02743	02966	03188	03411	03633	03855
4.50	1.504077	4300	4522	4744	4966	5188	5410	5632	5854	6075
1	6297	6519	6741	6962	7184	7405	7627	7848	8069	8291
2	8512	8733	8954	9175	9397	9618	9839	0059	0280	0501
3	10722	0943	1163	1384	1605	1825	2046	2266	2486	2707
4	2927	3147	3367	3588	3808	4028	4248	4468	4688	4907
5	5127	5347	5567	5786	6006	6226	6445	6665	6884	7103
6	7323	7542	7761	7980	8199	8419	8638	8857	9075	9294
7	9513	9732	9951	0169	0388	0607	0825	1044	1262	1481
8	21699	1917	2136	2354	2572	2790	3008	3226	3444	3662
9	3880	4098	4316	4533	4751	4969	5186	5404	5621	5839
4.60	1.526056	6274	6491	6708	6925	7143	7360	7577	7794	8011
1	8228	8445	8662	8878	9095	9312	9529	9745	9962	0178
2	30395	0611	0828	1044	1260	1476	1693	1909	2125	2341
3	2557	2773	2989	3205	3420	3636	3852	4068	4283	4499
4	4714	4930	5145	5361	5576	5791	6007	6222	6437	6652
5	6867	7082	7297	7512	7727	7942	8157	8371	8586	8801
6	9015	9230	9445	9659	9873	0088	0302	0516	0731	0945
7	41159	1373	1587	1801	2015	2229	2443	2657	2871	3084
8	3298	3512	3725	3939	4152	4366	4579	4793	5006	5219
9	5433	5646	5859	6072	6285	6498	6711	6924	7137	7350
4.70	1.547563	7775	7988	8201	8413	8626	8838	9051	9263	9476
1	9688	9900	0112	0325	0537	0749	0961	1173	1385	1597
2	51809	2021	2232	2444	2656	2868	3079	3291	3502	3714
3	3925	4137	4348	4559	4771	4982	5193	5404	5615	5826
4	6037	6248	6459	6670	6881	7091	7302	7513	7723	7934
5	8145	8355	8566	8776	8986	9197	9407	9617	9827	0038
6	60248	0458	0668	0878	1088	1298	1507	1717	1927	2137
7	2346	2556	2766	2975	3185	3394	3603	3813	4022	4231
8	4441	4650	4859	5068	5277	5486	5695	5904	6113	6322
9	6530	6739	6948	7157	7365	7574	7782	7991	8199	8408
4.80	1.568616	8824	9032	9241	9449	9657	9865	0073	0281	0489
1	70697	0905	1113	1321	1528	1736	1944	2151	2359	2566
2	2774	2981	3189	3396	3603	3811	4018	4225	4432	4639
3	4846	5053	5260	5467	5674	5881	6088	6295	6501	6708
4	6915	7121	7328	7534	7741	7947	8154	8360	8566	8772
5	8979	9185	9391	9597	9803	0009	0215	0421	0627	0833
6	81038	1244	1450	1656	1861	2067	2272	2478	2683	2889
7	3094	3299	3505	3710	3915	4120	4325	4530	4735	4940
8	5145	5350	5555	5760	5965	6169	6374	6579	6783	6988
9	7192	7397	7601	7806	8010	8214	8419	8623	8827	9031

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4.90	1.589235	9439	9643	9847	0051	0255	0459	0663	0867	1070
1	91274	1478	1681	1885	2088	2292	2495	2699	2902	3105
2	3309	3512	3715	3918	4121	4324	4527	4730	4933	5136
3	5339	5542	5745	5947	6150	6353	6555	6758	6960	7163
4	7365	7568	7770	7972	8175	8377	8579	8781	8983	9186
5	9388	9590	9792	9993	0195	0397	0599	0801	1002	1204
6	601406	1607	1809	2010	2212	2413	2615	2816	3017	3219
7	3420	3621	3822	4023	4224	4425	4626	4827	5028	5229
8	5430	5631	5831	6032	6233	6433	6634	6835	7035	7235
9	7436	7636	7837	8037	8237	8437	8638	8838	9038	9238
5.00	1.609438	9638	9838	0038	0238	0437	0637	0837	1037	1236
1	11436	1635	1835	2035	2234	2433	2633	2832	3031	3231
2	3430	3629	3828	4027	4226	4425	4624	4823	5022	5221
3	5420	5619	5818	6016	6215	6414	6612	6811	7009	7208
4	7406	7604	7803	8001	8199	8398	8596	8794	8992	9190
5	9388	9586	9784	9982	0180	0378	0576	0773	0971	1169
6	21366	1564	1762	1959	2157	2354	2552	2749	2946	3144
7	3341	3538	3735	3932	4129	4327	4524	4721	4917	5114
8	5311	5508	5705	5902	6098	6295	6492	6688	6885	7081
9	7278	7474	7671	7867	8063	8260	8456	8652	8848	9044
5.10	1.629241	9437	9633	9829	0025	0220	0416	0612	0808	1004
1	31199	1395	1591	1786	1982	2177	2373	2568	2764	2959
2	3154	3350	3545	3740	3935	4131	4326	4521	4716	4911
3	5106	5301	5495	5690	5885	6080	6275	6469	6664	6859
4	7053	7248	7442	7637	7831	8025	8220	8414	8608	8803
5	8997	9191	9385	9579	9773	9967	0161	0355	0549	0743
6	40937	1130	1324	1518	1711	1905	2099	2292	2486	2679
7	2873	3066	3259	3453	3646	3839	4033	4226	4419	4612
8	4805	4998	5191	5384	5577	5770	5963	6155	6348	6541
9	6734	6926	7119	7312	7504	7697	7889	8082	8274	8466
5.20	1.648659	8851	9043	9235	9428	9620	9812	0004	0196	0388
1	50580	0772	0964	1156	1347	1539	1731	1923	2114	2306
2	2497	2689	2880	3072	3263	3455	3646	3837	4029	4220
3	4411	4602	4794	4985	5176	5367	5558	5749	5940	6131
4	6321	6512	6703	6894	7085	7275	7466	7656	7847	8038
5	8228	8419	8609	8799	8990	9180	9370	9561	9751	9941
6	60131	0321	0511	0701	0891	1081	1271	1461	1651	1841
7	2030	2220	2410	2599	2789	2979	3168	3358	3547	3737
8	3926	4115	4305	4494	4683	4873	5062	5251	5440	5629
9	5818	6007	6196	6385	6574	6763	6952	7141	7329	7518
5.30	1.667707	7895	8084	8273	8461	8650	8838	9027	9215	9403
1	9592	9780	9968	0157	0345	0533	0721	0909	1097	1285
2	71473	1661	1849	2037	2225	2413	2600	2788	2976	3164
3	3351	3539	3726	3914	4101	4289	4476	4664	4851	5038
4	5226	5413	5600	5787	5974	6162	6349	6536	6723	6910
5	7097	7283	7470	7657	7844	8031	8217	8404	8591	8777
6	8964	9151	9337	9524	9710	9896	0083	0269	0455	0642
7	80828	1014	1200	1386	1573	1759	1945	2131	2317	2502
8	2688	2874	3060	3246	3432	3617	3803	3989	4174	4360
9	4545	4731	4916	5102	5287	5473	5658	5843	6029	6214

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5.40	1.686399	6584	6769	6954	7139	7324	7509	7694	7879	8064
1	8249	8434	8619	8803	8988	9173	9358	9542	9727	9911
2	90096	0280	0465	0649	0834	1018	1202	1386	1571	1755
3	1939	2123	2307	2491	2676	2860	3043	3227	3411	3595
4	3779	3963	4147	4330	4514	4698	4881	5065	5249	5432
5	5616	5799	5983	6166	6349	6533	6716	6899	7082	7266
6	7449	7632	7815	7998	8181	8364	8547	8730	8913	9096
7	9279	9461	9644	9827	0010	0192	0375	0558	0740	0923
8	701105	1288	1470	1652	1835	2017	2199	2382	2564	2746
9	2928	3110	3292	3475	3657	3839	4021	4202	4384	4566
5.50	1.704748	4930	5112	5293	5475	5657	5838	6020	6202	6383
1	6565	6746	6928	7109	7290	7472	7653	7834	8015	8197
2	8378	8559	8740	8921	9102	9283	9464	9645	9826	0007
3	10188	0369	0549	0730	0911	1092	1272	1453	1633	1814
4	1995	2175	2355	2536	2716	2897	3077	3257	3438	3618
5	3798	3978	4158	4338	4518	4698	4878	5058	5238	5418
6	5598	5778	5958	6138	6317	6497	6677	6856	7036	7216
7	7395	7575	7754	7934	8113	8292	8472	8651	8830	9010
8	9189	9368	9547	9726	9905	0084	0263	0442	0621	0800
9	20979	1158	1337	1516	1695	1873	2052	2231	2409	2588
5.60	1.722767	2945	3124	3302	3481	3659	3837	4016	4194	4372
1	4551	4729	4907	5085	5263	5442	5620	5798	5976	6154
2	6332	6510	6687	6865	7043	7221	7399	7576	7754	7932
3	8109	8287	8465	8642	8820	8997	9175	9352	9529	9707
4	9884	0061	0239	0416	0593	0770	0947	1124	1302	1479
5	31656	1833	2009	2186	2363	2540	2717	2894	3070	3247
6	3424	3601	3777	3954	4130	4307	4483	4660	4836	5013
7	5189	5365	5542	5718	5894	6071	6247	6423	6599	6775
8	6951	7127	7303	7479	7655	7831	8007	8183	8359	8534
9	8710	8886	9062	9237	9413	9589	9764	9940	0115	0291
5.70	1.740466	0642	0817	0992	1168	1343	1518	1693	1869	2044
1	2219	2394	2569	2744	2919	3094	3269	3444	3619	3794
2	3969	4144	4318	4493	4668	4843	5017	5192	5366	5541
3	5716	5890	6065	6239	6413	6588	6762	6936	7111	7285
4	7459	7633	7808	7982	8156	8330	8504	8678	8852	9026
5	9200	9374	9548	9721	9895	0069	0243	0417	0590	0764
6	50937	1111	1285	1458	1632	1805	1979	2152	2325	2499
7	2672	2845	3019	3192	3365	3538	3711	3885	4058	4231
8	4404	4577	4750	4923	5095	5268	5441	5614	5787	5960
9	6132	6305	6478	6650	6823	6995	7168	7341	7513	7685
5.80	1.757858	8030	8203	8375	8547	8720	8892	9064	9236	9408
1	9581	9753	9925	0097	0269	0441	0613	0785	0957	1128
2	61300	1472	1644	1816	1987	2159	2331	2502	2674	2845
3	3017	3189	3360	3531	3703	3874	4046	4217	4388	4560
4	4731	4902	5073	5244	5415	5587	5758	5929	6100	6271
5	6442	6613	6783	6954	7125	7296	7467	7638	7808	7979
6	8150	8320	8491	8661	8832	9002	9173	9343	9514	9684
7	9855	0025	0195	0366	0536	0706	0876	1046	1217	1387
8	71557	1727	1897	2067	2237	2407	2577	2747	2916	3086
9	3256	3426	3595	3765	3935	4105	4274	4444	4613	4783

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5.90	1.774952	5122	5291	5461	5630	5799	5969	6138	6307	6477
1	6646	6815	6984	7153	7322	7491	7661	7830	7999	8168
2	8336	8505	8674	8843	9012	9181	9349	9518	9687	9856
3	80024	0193	0361	0530	0699	0867	1036	1204	1372	1541
4	1709	1877	2046	2214	2382	2551	2719	2887	3055	3223
5	3391	3559	3727	3895	4063	4231	4399	4567	4735	4903
6	5070	5238	5406	5574	5741	5909	6077	6244	6412	6579
7	6747	6914	7082	7249	7417	7584	7751	7919	8086	8253
8	8421	8588	8755	8922	9089	9256	9423	9590	9757	9924
9	90091	0258	0425	0592	0759	0926	1093	1259	1426	1593
6.00	1.791759	1926	2093	2259	2426	2592	2759	2925	3092	3258
1	3425	3591	3757	3924	4090	4256	4423	4589	4755	4921
2	5087	5253	5419	5585	5751	5917	6083	6249	6415	6581
3	6747	6913	7079	7244	7410	7576	7742	7907	8073	8238
4	8404	8570	8735	8901	9066	9231	9397	9562	9728	9893
5	1.800058	0224	0389	0554	0719	0884	1050	1215	1380	1545
6	1710	1875	2040	2205	2370	2535	2699	2864	3029	3194
7	3359	3523	3688	3853	4017	4182	4347	4511	4676	4840
8	5005	5169	5334	5498	5662	5827	5991	6155	6320	6484
9	6648	6812	6976	7141	7305	7469	7633	7797	7961	8125
6.10	1.808289	8453	8617	8780	8944	9108	9272	9436	9599	9763
1	9927	0090	0254	0418	0581	0745	0908	1072	1235	1399
2	11562	1725	1889	2052	2215	2379	2542	2705	2868	3032
3	3195	3358	3521	3684	3847	4010	4173	4336	4499	4662
4	4825	4988	5150	5313	5476	5639	5801	5964	6127	6289
5	6452	6615	6777	6940	7102	7265	7427	7590	7752	7914
6	8077	8239	8401	8564	8726	8888	9050	9212	9375	9537
7	9699	9861	0023	0185	0347	0509	0671	0833	0995	1156
8	21318	1480	1642	1804	1965	2127	2289	2450	2612	2774
9	2935	3097	3258	3420	3581	3743	3904	4065	4227	4388
6.20	1.824549	4711	4872	5033	5194	5355	5517	5678	5839	6000
1	6161	6322	6483	6644	6805	6966	7127	7287	7448	7609
2	7770	7931	8091	8252	8413	8573	8734	8895	9055	9216
3	9376	9537	9697	9858	0018	0179	0339	0499	0660	0820
4	30980	1140	1301	1461	1621	1781	1941	2101	2261	2421
5	2581	2741	2901	3061	3221	3381	3541	3701	3861	4020
6	4180	4340	4500	4659	4819	4979	5138	5298	5457	5617
7	5776	5936	6095	6255	6414	6573	6733	6892	7051	7211
8	7370	7529	7688	7848	8007	8166	8325	8484	8643	8802
9	8961	9120	9279	9438	9597	9756	9915	0073	0232	0391
6.30	1.840550	0708	0867	1026	1184	1343	1502	1660	1819	1977
1	2136	2294	2453	2611	2769	2928	3086	3244	3403	3561
2	3719	3877	4036	4194	4352	4510	4668	4826	4984	5142
3	5300	5458	5616	5774	5932	6090	6248	6405	6563	6721
4	6879	7036	7194	7352	7509	7667	7825	7982	8140	8297
5	8455	8612	8770	8927	9085	9242	9399	9557	9714	9871
6	50028	0186	0343	0500	0657	0814	0971	1128	1285	1442
7	1599	1756	1913	2070	2227	2384	2541	2698	2855	3011
8	3168	3325	3482	3638	3795	3951	4108	4265	4421	4578
9	4734	4891	5047	5204	5360	5516	5673	5829	5985	6142

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6.40	1.856298	6454	6610	6767	6923	7079	7235	7391	7547	7703
1	7859	8015	8171	8327	8483	8639	8795	8951	9107	9262
2	9418	9574	9730	9885	0041	0197	0352	0508	0663	0819
3	60975	1130	1286	1441	1596	1752	1907	2063	2218	2373
4	2529	2684	2839	2994	3149	3305	3460	3615	3770	3925
5	4080	4235	4390	4545	4700	4855	5010	5165	5320	5475
6	5629	5784	5939	6094	6248	6403	6558	6712	6867	7022
7	7176	7331	7485	7640	7794	7949	8103	8257	8412	8566
8	8721	8875	9029	9183	9338	9492	9646	9800	9954	0108
9	70263	0417	0571	0725	0879	1033	1187	1341	1494	1648
6.50	1.871802	1956	2110	2264	2417	2571	2725	2879	3032	3186
1	3339	3493	3647	3800	3954	4107	4261	4414	4568	4721
2	4874	5028	5181	5334	5488	5641	5794	5947	6101	6254
3	6407	6560	6713	6866	7019	7172	7325	7478	7631	7784
4	7937	8090	8243	8396	8549	8701	8854	9007	9160	9312
5	9465	9618	9770	9923	0076	0228	0381	0533	0686	0838
6	80991	1143	1295	1448	1600	1753	1905	2057	2209	2362
7	2514	2666	2818	2970	3122	3275	3427	3579	3731	3883
8	4035	4187	4339	4491	4642	4794	4946	5098	5250	5402
9	5553	5705	5857	6008	6160	6312	6463	6615	6767	6918
6.60	1.887070	7221	7373	7524	7676	7827	7978	8130	8281	8432
1	8584	8735	8886	9037	9189	9340	9491	9642	9793	9944
2	90095	0246	0397	0548	0699	0850	1001	1152	1303	1454
3	1605	1756	1906	2057	2208	2359	2509	2660	2811	2961
4	3112	3263	3413	3564	3714	3865	4015	4166	4316	4466
5	4617	4767	4918	5068	5218	5368	5519	5669	5819	5969
6	6119	6270	6420	6570	6720	6870	7020	7170	7320	7470
7	7620	7770	7920	8070	8219	8369	8519	8669	8819	8968
8	9118	9268	9417	9567	9717	9866	0016	0165	0315	0464
9	900614	0763	0913	1062	1212	1361	1510	1660	1809	1958
6.70	1.902108	2257	2406	2555	2704	2854	3003	3152	3301	3450
1	3599	3748	3897	4046	4195	4344	4493	4642	4790	4939
2	5088	5237	5386	5534	5683	5832	5981	6129	6278	6427
3	6575	6724	6872	7021	7169	7318	7466	7615	7763	7912
4	8060	8208	8357	8505	8653	8801	8950	9098	9246	9394
5	9543	9691	9839	9987	0135	0283	0431	0579	0727	0875
6	11023	1171	1319	1467	1614	1762	1910	2058	2206	2353
7	2501	2649	2796	2944	3092	3239	3387	3535	3682	3830
8	3977	4125	4272	4419	4567	4714	4862	5009	5156	5304
9	5451	5598	5745	5893	6040	6187	6334	6481	6628	6776
6.80	1.916923	7070	7217	7364	7511	7658	7805	7951	8098	8245
1	8392	8539	8686	8833	8979	9126	9273	9419	9566	9713
2	9859	0006	0153	0299	0446	0592	0739	0885	1032	1178
3	21325	1471	1617	1764	1910	2056	2203	2349	2495	2642
4	2788	2934	3080	3226	3372	3518	3665	3811	3957	4103
5	4249	4395	4541	4687	4832	4978	5124	5270	5416	5562
6	5707	5853	5999	6145	6290	6436	6582	6727	6873	7019
7	7164	7310	7455	7601	7746	7892	8037	8183	8328	8473
8	8619	8764	8909	9055	9200	9345	9490	9636	9781	9926
9	30071	0216	0361	0506	0651	0797	0942	1087	1232	1376

x	0	1	2	3	4	5	6	7	8	9
6.90	1.931521	1666	1811	1956	2101	2246	2391	2535	2680	2825
1	2970	3114	3259	3404	3548	3693	3838	3982	4127	4271
2	4416	4560	4705	4849	4994	5138	5282	5427	5571	5716
3	5860	6004	6148	6293	6437	6581	6725	6869	7014	7158
4	7302	7446	7590	7734	7878	8022	8166	8310	8454	8598
5	8742	8886	9029	9173	9317	9461	9605	9748	9892	0036
6	40179	0323	0467	0610	0754	0898	1041	1185	1328	1472
7	1615	1759	1902	2046	2189	2332	2476	2619	2762	2906
8	3049	3192	3335	3479	3622	3765	3908	4051	4194	4337
9	4481	4624	4767	4910	5053	5196	5339	5481	5624	5767
7.00	1.945910	6053	6196	6339	6481	6624	6767	6910	7052	7195
1	7338	7480	7623	7766	7908	8051	8193	8336	8478	8621
2	8763	8906	9048	9190	9333	9475	9618	9760	9902	0044
3	50187	0329	0471	0613	0756	0898	1040	1182	1324	1466
4	1608	1750	1892	2034	2176	2318	2460	2602	2744	2886
5	3028	3169	3311	3453	3595	3737	3878	4020	4162	4303
6	4445	4587	4728	4870	5011	5153	5295	5436	5578	5719
7	5860	6002	6143	6285	6426	6567	6709	6850	6991	7133
8	7274	7415	7556	7698	7839	7980	8121	8262	8403	8544
9	8685	8826	8967	9108	9249	9390	9531	9672	9813	9954
7.10	1.960095	0236	0376	0517	0658	0799	0939	1080	1221	1362
1	1502	1643	1783	1924	2065	2205	2346	2486	2627	2767
2	2908	3048	3189	3329	3469	3610	3750	3890	4031	4171
3	4311	4451	4592	4732	4872	5012	5152	5293	5433	5573
4	5713	5853	5993	6133	6273	6413	6553	6693	6833	6972
5	7112	7252	7392	7532	7672	7811	7951	8091	8231	8370
6	8510	8650	8789	8929	9068	9208	9348	9487	9627	9766
7	9906	0045	0185	0324	0463	0603	0742	0881	1021	1160
8	71299	1439	1578	1717	1856	1996	2135	2274	2413	2552
9	2691	2830	2969	3108	3247	3386	3525	3664	3803	3942
7.20	1.974081	4220	4359	4498	4636	4775	4914	5053	5192	5330
1	5469	5608	5746	5885	6024	6162	6301	6439	6578	6716
2	6855	6993	7132	7270	7409	7547	7686	7824	7962	8101
3	8239	8377	8516	8654	8792	8930	9069	9207	9345	9483
4	9621	9759	9897	0035	0174	0312	0450	0588	0726	0864
5	81001	1139	1277	1415	1553	1691	1829	1967	2104	2242
6	2380	2518	2655	2793	2931	3068	3206	3344	3481	3619
7	3756	3894	4031	4169	4306	4444	4581	4719	4856	4993
8	5131	5268	5406	5543	5680	5817	5955	6092	6229	6366
9	6504	6641	6778	6915	7052	7189	7326	7463	7600	7737
7.30	1.987874	8011	8148	8285	8422	8559	8696	8833	8970	9106
1	9243	9380	9517	9654	9790	9927	0064	0200	0337	0474
2	90610	0747	0884	1020	1157	1293	1430	1566	1703	1839
3	1976	2112	2248	2385	2521	2657	2794	2930	3066	3203
4	3339	3475	3611	3747	3884	4020	4156	4292	4428	4564
5	4700	4836	4972	5108	5244	5380	5516	5652	5788	5924
6	6060	6196	6332	6467	6603	6739	6875	7011	7146	7282
7	7418	7553	7689	7825	7960	8096	8231	8367	8503	8638
8	8774	8909	9045	9180	9315	9451	9586	9722	9857	9992
9	2.000128	0263	0398	0534	0669	0804	0939	1075	1210	1345

x	0	1	2	3	4	5	6	7	8	9
7.40	2.001480	1615	1750	1885	2020	2155	2290	2425	2560	2695
1	2830	2965	3100	3235	3370	3505	3640	3775	3909	4044
2	4179	4314	4449	4583	4718	4853	4987	5122	5257	5391
3	5526	5660	5795	5930	6064	6199	6333	6468	6602	6736
4	6871	7005	7140	7274	7408	7543	7677	7811	7946	8080
5	8214	8348	8482	8617	8751	8885	9019	9153	9287	9421
6	9555	9689	9823	9957	0091	0225	0359	0493	0627	0761
7	10895	1029	1163	1297	1430	1564	1700	1832	1965	2099
8	2233	2366	2500	2634	2767	2901	3035	3168	3302	3435
9	3569	3702	3836	3969	4103	4236	4370	4503	4636	4770
7.50	2.014903	5036	5170	5303	5436	5569	5703	5836	5969	6102
1	6235	6369	6502	6635	6768	6901	7034	7167	7300	7433
2	7566	7699	7832	7965	8098	8231	8364	8497	8629	8762
3	8895	9028	9161	9293	9426	9559	9692	9824	9957	0090
4	20222	0355	0487	0620	0753	0885	1018	1150	1283	1415
5	1548	1680	1812	1945	2077	2210	2342	2474	2607	2739
6	2871	3003	3136	3268	3400	3532	3665	3797	3929	4061
7	4193	4325	4457	4589	4721	4853	4985	5117	5249	5381
8	5513	5645	5777	5909	6041	6173	6304	6436	6568	6700
9	6832	6963	7095	7227	7358	7490	7622	7753	7885	8017
7.60	2.028148	8280	8411	8543	8674	8806	8937	9069	9200	9332
1	9463	9595	9726	9857	9989	0120	0251	0383	0514	0645
2	30776	0908	1039	1170	1301	1432	1563	1695	1826	1957
3	2088	2219	2350	2481	2612	2743	2874	3005	3136	3267
4	3398	3528	3659	3790	3921	4052	4183	4313	4444	4575
5	4706	4836	4967	5098	5228	5359	5490	5620	5751	5881
6	6012	6143	6273	6404	6534	6665	6795	6925	7056	7186
7	7317	7447	7577	7708	7838	7968	8099	8229	8359	8489
8	8620	8750	8880	9010	9140	9270	9400	9531	9661	9791
9	9921	0051	0181	0311	0441	0571	0701	0831	0961	1090
7.70	2.041220	1350	1480	1610	1740	1869	1999	2129	2259	2388
1	2518	2648	2778	2907	3037	3166	3296	3426	3555	3685
2	3814	3944	4073	4203	4332	4462	4591	4721	4850	4979
3	5109	5238	5368	5497	5626	5755	5885	6014	6143	6272
4	6402	6531	6660	6789	6918	7047	7177	7306	7435	7564
5	7693	7822	7951	8080	8209	8338	8467	8596	8725	8853
6	8982	9111	9240	9369	9498	9626	9755	9884	0013	0141
7	50270	0399	0528	0656	0785	0913	1042	1171	1299	1428
8	1556	1685	1813	1942	2070	2199	2327	2456	2584	2712
9	2841	2969	3098	3226	3354	3483	3611	3739	3867	3996
7.80	2.054124	4252	4380	4508	4636	4765	4893	5021	5149	5277
1	5405	5533	5661	5789	5917	6045	6173	6301	6429	6557
2	6685	6812	6940	7068	7196	7324	7452	7579	7707	7835
3	7963	8090	8218	8346	8473	8601	8729	8856	8984	9111
4	9239	9366	9494	9621	9749	9876	0004	0131	0259	0386
5	60514	0641	0768	0896	1023	1150	1278	1405	1532	1659
6	1787	1914	2041	2168	2295	2423	2550	2677	2804	2931
7	3058	3185	3312	3439	3566	3693	3820	3947	4074	4201
8	4328	4455	4582	4709	4835	4962	5089	5216	5343	5469
9	5596	5723	5850	5976	6103	6230	6356	6483	6610	6736

x	0	1	2	3	4	5	6	7	8	9
7.90	2.066863	6989	7116	7242	7369	7495	7622	7748	7875	8001
1	8128	8254	8381	8507	8633	8760	8886	9012	9139	9265
2	9391	9517	9644	9770	9896	0022	0148	0275	0401	0527
3	70653	0779	0905	1031	1157	1283	1409	1535	1661	1787
4	1913	2039	2165	2291	2417	2543	2669	2794	2920	3046
5	3172	3298	3423	3549	3675	3801	3926	4052	4178	4303
6	4429	4555	4680	4806	4931	5057	5182	5308	5434	5559
7	5684	5810	5935	6061	6186	6312	6437	6562	6688	6813
8	6938	7064	7189	7314	7440	7565	7690	7815	7940	8066
9	8191	8316	8441	8566	8691	8816	8941	9066	9192	9317
8.00	2.079442	9567	9692	9816	9941	0066	0191	0316	0441	0566
1	80691	0816	0940	1065	1190	1315	1440	1564	1689	1814
2	1938	2063	2188	2312	2437	2562	2686	2811	2935	3060
3	3185	3309	3434	3558	3683	3807	3931	4056	4180	4305
4	4429	4553	4678	4802	4926	5051	5175	5299	5424	5548
5	5672	5796	5921	6045	6169	6293	6417	6541	6665	6789
6	6914	7038	7162	7286	7410	7534	7658	7782	7906	8030
7	8153	8277	8401	8525	8649	8773	8897	9021	9144	9268
8	9392	9516	9639	9763	9887	0010	0134	0258	0381	0505
9	90629	0752	0876	0999	1123	1247	1370	1494	1617	1741
8.10	2.091864	1988	2111	2234	2358	2481	2605	2728	2851	2975
1	3098	3221	3344	3468	3591	3714	3837	3961	4084	4207
2	4330	4453	4576	4700	4823	4946	5069	5192	5315	5438
3	5561	5684	5807	5930	6053	6176	6299	6422	6544	6667
4	6790	6913	7036	7159	7281	7404	7527	7650	7772	7895
5	8018	8141	8263	8386	8509	8631	8754	8876	8999	9122
6	9244	9367	9489	9612	9734	9857	9979	0102	0224	0347
7	100469	0591	0714	0836	0958	1081	1203	1325	1448	1570
8	1692	1814	1937	2059	2181	2303	2425	2548	2670	2792
9	2914	3036	3158	3280	3402	3524	3646	3768	3890	4012
8.20	2.104134	4256	4378	4500	4622	4744	4866	4987	5109	5231
1	5353	5475	5596	5718	5840	5962	6083	6205	6327	6449
2	6570	6692	6813	6935	7057	7178	7300	7421	7543	7665
3	7786	7908	8029	8150	8272	8393	8515	8636	8758	8879
4	9000	9122	9243	9364	9486	9607	9728	9849	9971	0092
5	10213	0334	0456	0577	0698	0819	0940	1061	1182	1304
6	1425	1546	1667	1788	1909	2030	2151	2272	2393	2514
7	2635	2755	2876	2997	3118	3239	3360	3481	3601	3722
8	3843	3964	4084	4205	4326	4447	4567	4688	4809	4929
9	5050	5171	5291	5412	5532	5653	5773	5894	6015	6135
8.30	2.116256	6376	6496	6617	6737	6858	6978	7099	7219	7339
1	7460	7580	7700	7821	7941	8061	8181	8302	8422	8542
2	8662	8782	8903	9023	9143	9263	9383	9503	9623	9743
3	9863	9983	0104	0224	0344	0464	0583	0703	0823	0943
4	21063	1183	1303	1423	1543	1663	1782	1902	2022	2142
5	2262	2381	2501	2621	2740	2860	2980	3100	3219	3339
6	3458	3578	3698	3817	3937	4056	4176	4295	4415	4534
7	4654	4773	4893	5012	5132	5251	5370	5490	5609	5729
8	5848	5967	6087	6206	6325	6444	6564	6683	6802	6921
9	7041	7160	7279	7398	7517	7636	7755	7874	7994	8113

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8.40	2.128232	8351	8470	8589	8708	8827	8946	9065	9184	9303
1	9421	9540	9659	9778	9897	0016	0135	0253	0372	0491
2	30610	0729	0847	0966	1085	1203	1322	1441	1559	1678
3	1797	1915	2034	2153	2271	2390	2508	2627	2745	2864
4	2982	3101	3219	3338	3456	3575	3693	3811	3930	4048
5	4166	4285	4403	4521	4640	4758	4876	4995	5113	5231
6	5349	5467	5586	5704	5822	5940	6058	6176	6294	6412
7	6531	6649	6767	6885	7003	7121	7239	7357	7475	7593
8	7710	7828	7946	8064	8182	8300	8418	8536	8653	8771
9	8889	9007	9125	9242	9360	9478	9595	9713	9831	9949
8.50	2.140066	0184	0301	0419	0537	0654	0772	0889	1007	1124
1	1242	1359	1477	1594	1712	1829	1947	2064	2182	2299
2	2416	2534	2651	2768	2886	3003	3120	3238	3355	3472
3	3589	3707	3824	3941	4058	4175	4293	4410	4527	4644
4	4761	4878	4995	5112	5229	5346	5463	5580	5697	5814
5	5931	6048	6165	6282	6399	6516	6633	6750	6867	6983
6	7100	7217	7334	7451	7567	7684	7801	7918	8034	8151
7	8268	8384	8501	8618	8734	8851	8968	9084	9201	9317
8	9434	9550	9667	9784	9900	0016	0133	0249	0366	0482
9	50599	0715	0832	0948	1064	1181	1297	1413	1530	1646
8.60	2.151762	1878	1995	2111	2227	2343	2460	2576	2692	2808
1	2924	3040	3157	3273	3389	3505	3621	3737	3853	3969
2	4085	4201	4317	4433	4549	4665	4781	4897	5013	5129
3	5245	5360	5476	5592	5708	5824	5940	6055	6171	6287
4	6403	6518	6634	6750	6865	6981	7097	7212	7328	7444
5	7559	7675	7791	7906	8022	8137	8253	8368	8484	8599
6	8715	8830	8946	9061	9177	9292	9407	9523	9638	9753
7	9869	9984	0099	0215	0330	0445	0561	0676	0791	0906
8	61022	1137	1252	1367	1482	1597	1713	1828	1943	2058
9	2173	2288	2403	2518	2633	2748	2863	2978	3093	3208
8.70	2.163323	3438	3553	3668	3783	3898	4012	4127	4242	4357
1	4472	4587	4701	4816	4931	5046	5160	5275	5390	5505
2	5619	5734	5849	5963	6078	6192	6307	6422	6536	6651
3	6765	6880	6994	7109	7223	7338	7452	7567	7681	7796
4	7910	8025	8139	8253	8368	8482	8596	8711	8825	8939
5	9054	9168	9282	9396	9511	9625	9739	9853	9968	0082
6	70196	0310	0424	0538	0652	0767	0881	0995	1109	1223
7	1337	1451	1565	1679	1793	1907	2021	2135	2249	2363
8	2476	2590	2704	2818	2932	3046	3160	3273	3387	3501
9	3615	3728	3842	3956	4070	4183	4297	4411	4524	4638
8.80	2.174752	4865	4979	5093	5206	5320	5433	5547	5660	5774
1	5887	6001	6114	6228	6341	6455	6568	6682	6795	6908
2	7022	7135	7249	7362	7475	7589	7702	7815	7928	8042
3	8155	8268	8381	8495	8608	8721	8834	8947	9061	9174
4	9287	9400	9513	9626	9739	9852	9965	0078	0191	0304
5	80417	0530	0643	0756	0869	0982	1095	1208	1321	1434
6	1547	1660	1772	1885	1998	2111	2224	2337	2449	2562
7	2675	2788	2900	3013	3126	3238	3351	3464	3576	3689
8	3802	3914	4027	4139	4252	4364	4477	4590	4702	4815
9	4927	5040	5152	5264	5377	5489	5602	5714	5827	5939

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8.90	2.186051	6164	6276	6388	6501	6613	6725	6837	6950	7062
1	7174	7286	7399	7511	7623	7735	7847	7960	8072	8184
2	8296	8408	8520	8632	8744	8856	8968	9080	9192	9304
3	9416	9528	9640	9752	9864	9976	0088	0200	0312	0424
4	90536	0647	0759	0871	0983	1095	1207	1318	1430	1542
5	1654	1765	1877	1989	2100	2212	2324	2435	2547	2659
6	2770	2882	2993	3105	3217	3328	3440	3551	3663	3774
7	3886	3997	4109	4220	4332	4443	4554	5666	4777	4889
8	5000	5111	5223	5334	5445	5557	5668	5779	5890	6002
9	6113	6224	6335	6446	6558	6669	6780	6891	7002	7113
9.00	2.197225	7336	7447	7558	7669	7780	7891	8002	8113	8224
1	8335	8446	8557	8668	8779	8890	9001	9112	9223	9333
2	9444	9555	9666	9777	9888	9999	0109	0220	0331	0442
3	200552	0663	0774	0885	0995	1106	1217	1327	1438	1549
4	1659	1770	1880	1991	2102	2212	2323	2433	2544	2654
5	2765	2875	2986	3096	3207	3317	3428	3538	3648	3759
6	3869	3979	4090	4200	4311	4421	4531	4641	4752	4862
7	4972	5083	5193	5303	5413	5523	5634	5744	5854	5964
8	6074	6184	6294	6405	6515	6625	6735	6845	6955	7065
9	7175	7285	7395	7505	7615	7725	7835	7945	8055	8165
9.10	2.208274	8384	8494	8604	8714	8824	8934	9043	9153	9263
1	9373	9482	9592	9702	9812	9921	0031	0141	0250	0360
2	10470	0579	0689	0799	0908	1018	1127	1237	1347	1456
3	1566	1675	1785	1894	2004	2113	2223	2332	2442	2551
4	2660	2770	2879	2989	3098	3207	3317	3426	3535	3645
5	3754	3863	3972	4082	4191	4300	4409	4519	4628	4737
6	4846	4955	5064	5174	5283	5392	5501	5610	5719	5828
7	5937	6046	6155	6264	6373	6482	6591	6700	6809	6918
8	7027	7136	7245	7354	7463	7572	7681	7789	7898	8007
9	8116	8225	8334	8442	8551	8660	8769	8877	8986	9095
9.20	2.219203	9312	9421	9530	9638	9747	9855	9964	0073	0181
1	20290	0398	0507	0616	0724	0833	0941	1050	1158	1267
2	1375	1483	1592	1700	1809	1917	2026	2134	2242	2351
3	2459	2567	2676	2784	2892	3001	3109	3217	3325	3434
4	3542	3650	3758	3867	3975	4083	4191	4299	4407	4515
5	4624	4732	4840	4948	5056	5164	5272	5380	5488	5596
6	5704	5812	5920	6028	6136	6244	6352	6460	6568	6675
7	6783	6891	6999	7107	7215	7323	7430	7538	7646	7754
8	7862	7969	8077	8185	8292	8400	8508	8616	8723	8831
9	8939	9046	9154	9261	9369	9477	9584	9692	9799	9907
9.30	2.230014	0122	0229	0337	0444	0552	0659	0767	0874	0982
1	1089	1196	1304	1411	1519	1626	1733	1841	1948	2055
2	2163	2270	2377	2484	2592	2699	2806	2913	3021	3128
3	3235	3342	3449	3557	3664	3771	3878	3985	4092	4199
4	4306	4413	4520	4627	4734	4841	4948	5055	5162	5269
5	5376	5483	5590	5697	5804	5911	6018	6125	6232	6338
6	6445	6552	6659	6766	6873	6979	7086	7193	7300	7406
7	7513	7620	7727	7833	7940	8047	8153	8260	8367	8473
8	8580	8686	8793	8900	9006	9113	9219	9326	9432	9539
9	9645	9752	9858	9965	0071	0178	0284	0390	0497	0603

x	0	1	2	3	4	5	6	7	8	9
9.40	2.240710	0816	0922	1029	1135	1241	1348	1454	1560	1667
1	1773	1879	1985	2092	2198	2304	2410	2517	2623	2729
2	2835	2941	3047	3154	3260	3366	3472	3578	3684	3790
3	3896	4002	4108	4214	4320	4426	4532	4638	4744	4850
4	4956	5062	5168	5274	5380	5486	5591	5697	5803	5909
5	6015	6121	6226	6332	6438	6544	6649	6755	6861	6967
6	7072	7178	7284	7389	7495	7601	7706	7812	7918	8023
7	8129	8234	8340	8446	8551	8657	8762	8868	8973	9079
8	9184	9290	9395	9501	9606	9712	9817	9922	0028	0133
9	50239	0344	0449	0555	0660	0765	0871	0976	1081	1187
9.50	2.251292	1397	1502	1608	1713	1818	1923	2028	2134	2239
1	2344	2449	2554	2659	2764	2870	2975	3080	3185	3290
2	3395	3500	3605	3710	3815	3920	4025	4130	4235	4340
3	4445	4550	4655	4759	4864	4969	5074	5179	5284	5389
4	5493	5598	5703	5808	5913	6017	6122	6227	6332	6436
5	6541	6646	6751	6855	6960	7065	7169	7274	7379	7483
6	7588	7692	7797	7901	8006	8111	8215	8320	8424	8529
7	8633	8738	8842	8947	9051	9156	9260	9364	9469	9573
8	9678	9782	9886	9991	0095	0199	0304	0408	0512	0617
9	60721	0825	0929	1034	1138	1242	1346	1451	1555	1659
9.60	2.261763	1867	1971	2076	2180	2284	2388	2492	2596	2700
1	2804	2908	3012	3116	3220	3324	3428	3532	3636	3740
2	3844	3948	4052	4156	4260	4364	4468	4572	4676	4779
3	4883	4987	5091	5195	5299	5402	5506	5610	5714	5817
4	5921	6025	6129	6232	6336	6440	6543	6647	6751	6854
5	6958	7062	7165	7269	7372	7476	7579	7683	7787	7890
6	7994	8097	8201	8304	8408	8511	8615	8718	8821	8925
7	9028	9132	9235	9338	9442	9545	9649	9752	9855	9959
8	70062	0165	0268	0372	0475	0578	0682	0785	0888	0991
9	1094	1198	1301	1404	1507	1610	1713	1817	1920	2023
9.70	2.272126	2229	2332	2435	2538	2641	2744	2847	2950	3053
1	3156	3259	3362	3465	3568	3671	3774	3877	3980	4083
2	4186	4288	4391	4494	4597	4700	4803	4906	5008	5111
3	5214	5317	5419	5522	5625	5728	5830	5933	6036	6138
4	6241	6344	6446	6549	6652	6754	6857	6960	7062	7165
5	7267	7370	7472	7575	7677	7780	7882	7985	8087	8190
6	8292	8395	8497	8600	8702	8805	8907	9009	9112	9214
7	9316	9419	9521	9623	9726	9828	9930	0033	0135	0237
8	80339	0442	0544	0646	0748	0851	0953	1055	1157	1259
9	1361	1464	1566	1668	1770	1872	1974	2076	2178	2280
9.80	2.282382	2484	2586	2688	2790	2892	2994	3096	3198	3300
1	3402	3504	3606	3708	3810	3912	4014	4116	4217	4319
2	4421	4523	4625	4727	4828	4930	5032	5134	5235	5337
3	5439	5541	5642	5744	5846	5947	6049	6151	6252	6354
4	6456	6557	6659	6761	6862	6964	7065	7167	7268	7370
5	7471	7573	7674	7776	7877	7979	8080	8182	8283	8385
6	8486	8588	8689	8790	8892	8993	9095	9196	9297	9399
7	9500	9601	9702	9804	9905	0006	0108	0209	0310	0411
8	90513	0614	0715	0816	0917	1018	1120	1221	1322	1423
9	1524	1625	1726	1827	1929	2030	2131	2232	2333	2434

x	0	1	2	3	4	5	6	7	8	9
9.90	2.292535	2636	2737	2838	2939	3040	3141	3242	3343	3443
1	3544	3645	3746	3847	3948	4049	4150	4250	4351	4452
2	4553	4654	4755	4855	4956	5057	5158	5258	5359	5460
3	5560	5661	5762	5863	5963	6064	6165	6265	6366	6466
4	6567	6668	6768	6869	6969	7070	7170	7271	7372	7472
5	7573	7673	7774	7874	7974	8075	8175	8276	8376	8477
6	8577	8677	8778	8878	8979	9079	9179	9280	9380	9480
7	9581	9681	9781	9881	9982	0082	0182	0282	0383	0483
8	300583	0683	0783	0884	0984	1084	1184	1284	1384	1484
9	1585	1685	1785	1885	1985	2085	2185	2285	2385	2485

TABLE XI.—EXPONENTIAL AND HYPERBOLIC FUNCTIONS

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.000	**1.000000**	**1.000000**	**0.000000**	**1.000000**	**0.000000**
1	1001	0.999000	1000	0001	1000
2	2002	8002	2000	0002	2000
3	3005	7004	3000	0005	3000
4	4008	6008	4000	0008	4000
5	5013	5012	5000	0013	5000
6	6018	4018	6000	0018	6000
7	7025	3024	7000	0025	7000
8	8032	2032	8000	0032	8000
9	9041	1040	9000	0041	9000
0.010	**1.010050**	**0.990050**	**0.010000**	**1.000050**	**0.010000**
1	1061	89060	1000	0061	1000
2	2072	8072	2000	0072	1999
3	3085	7084	3000	0085	2999
4	4098	6098	4000	0098	3999
5	5113	5112	5001	0113	4999
6	6129	4127	6001	0128	5999
7	7145	3144	7001	0145	6998
8	8163	2161	8001	0162	7998
9	9182	1179	9001	0181	8998
0.020	**1.020201**	**0.980199**	**0.020001**	**1.000200**	**0.019997**
1	1222	79219	1002	0221	20997
2	2244	8240	2002	0242	1996
3	3267	7262	3002	0265	2996
4	4290	6286	4002	0288	3995
5	5315	5310	5003	0313	4995
6	6341	4335	6003	0338	5994
7	7368	3361	7003	0365	6993
8	8396	2388	8004	0392	7993
9	9425	1416	9004	0421	8992
0.030	**1.030455**	**0.970446**	**0.030005**	**1.000450**	**0.029991**
1	1486	69476	1005	0481	30990
2	2518	8507	2005	0512	1989
3	3551	7539	3006	0545	2988
4	4585	6572	4007	0578	3987
5	5620	5605	5007	0613	4986
6	6656	4640	6008	0648	5984
7	7693	3676	7008	0685	6983
8	8731	2713	8009	0722	7982
9	9770	1751	9010	0761	8980
0.040	**1.040811**	**0.960789**	**0.040011**	**1.000800**	**0.039979**
1	1852	59829	1011	0841	40977
2	2894	8870	2012	0882	1975
3	3938	7911	3013	0925	2974
4	4982	6954	4014	0968	3972
5	6028	5997	5015	1013	4970
6	7074	5042	6016	1058	5968
7	8122	4087	7017	1105	6965
8	9171	3134	8018	1152	7963
9	50220	2181	9020	1201	8961

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.050	**1.051271**	**0.951229**	**0.050021**	**1.001250**	**0.049958**
1	2323	0279	1022	1301	50956
2	3376	49329	2023	1352	1953
3	4430	8380	3025	1405	2950
4	5485	7432	4026	1458	3948
5	6541	6485	5028	1513	4945
6	7580	5539	6029	1568	5942
7	8656	4594	7031	1625	6938
8	9715	3650	8033	1682	7935
9	60775	2707	9034	1741	8932
0.060	**1.061837**	**0.941765**	**0.060036**	**1.001801**	**0.059928**
1	2899	0823	1038	1861	60924
2	3962	39883	2040	1923	1921
3	5027	8943	3042	1985	2917
4	6092	8005	4044	2049	3913
5	7159	7067	5046	2113	4909
6	8227	6131	6048	2179	5904
7	9295	5195	7050	2245	6900
8	70365	4260	8052	2313	7895
9	1436	3327	9055	2381	8891
0.070	**1.072508**	**0.932394**	**0.070057**	**1.002451**	**0.069886**
1	3581	1462	1060	2522	70881
2	4655	0531	2062	2593	1876
3	5731	29601	3065	2666	2871
4	6807	8672	4068	2739	3865
5	7884	7743	5070	2814	4860
6	8963	6816	6073	2889	5854
7	80042	5890	7076	2966	6848
8	1123	4964	8079	3044	7842
9	2204	4040	9082	3122	8836
0.080	**1.083287**	**0.923116**	**0.080085**	**1.003202**	**0.079830**
1	4371	2194	1089	3282	80823
2	5456	1272	2092	3364	1817
3	6542	0351	3095	3446	2810
4	7629	19431	4099	3530	3803
5	8717	8512	5102	3615	4796
6	9806	7594	6106	3700	5789
7	90897	6677	7110	3787	6781
8	1988	5761	8114	3874	7774
9	3081	4846	9118	3963	8766
0.090	**1.094174**	**0.913931**	**0.090122**	**1.004053**	**0.089758**
1	5269	3018	1126	4143	90750
2	6365	2105	2130	4235	1741
3	7462	1194	3134	4328	2733
4	8560	0283	4138	4421	3724
5	9659	09373	5143	4516	4715
6	100759	8464	6148	4612	5706
7	1860	7556	7152	4708	6697
8	2963	6649	8157	4806	7687
9	4066	5743	9162	4905	8678

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.100	**1.105171**	**0.904837**	**0.100167**	**1.005004**	**0.099668**
1	6277	3933	1172	5105	100658
2	7383	3030	2177	5207	101648
3	8491	2127	3182	5309	2637
4	9600	1225	4188	5413	3627
5	10711	0325	5193	5518	4616
6	1822	0.899425	6199	5623	5605
7	2934	8526	7204	5730	6594
8	4048	7628	8210	5838	7582
9	5162	6730	9216	5946	8570
0.110	**1.116278**	**0.895834**	**0.110222**	**1.006056**	**0.109558**
1	7395	4939	1228	6167	10546
2	8513	4044	2234	6279	1534
3	9632	3151	3241	6391	2521
4	20752	2258	4247	6505	3509
5	1873	1366	5254	6620	4496
6	2996	0475	6260	6736	5482
7	4119	0.889585	7267	6852	6469
8	5244	8696	8274	6970	7455
9	6370	7808	9281	7089	8441
0.120	**1.127497**	**0.886920**	**0.120288**	**1.007209**	**0.119427**
1	8625	6034	1295	7329	20413
2	9754	5148	2303	7451	1398
3	30884	4264	3310	7574	2383
4	2016	3380	4318	7698	3368
5	3148	2497	5326	7823	4353
6	4282	1615	6334	7949	5337
7	5417	0734	7342	8075	6322
8	6553	79853	8350	8203	7305
9	7690	8974	9358	8332	8289
0.130	**1.138828**	**0.878095**	**0.130366**	**1.008462**	**0.129273**
1	9968	7218	1375	8593	30256
2	41108	6341	2384	8725	1239
3	2250	5465	3392	8858	2221
4	3393	4590	4401	8991	3204
5	4537	3716	5410	9126	4186
6	5682	2843	6420	9262	5168
7	6828	1970	7429	9399	6149
8	7976	1099	8438	9537	7131
9	9124	0228	9448	9676	8112
0.140	**1.150274**	**0.869358**	**0.140458**	**1.009816**	**0.139092**
1	1425	8489	1468	9957	40073
2	2577	7621	2478	10099	1053
3	3730	6754	3488	0242	2033
4	4884	5888	4498	0386	3013
5	6040	5022	5509	0531	3992
6	7196	4158	6519	0677	4971
7	8354	3294	7530	0824	5950
8	9513	2431	8541	0972	6929
9	60673	1569	9552	1121	7907

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.150	**1.161834**	**0.860708**	**0.150563**	**1.011271**	**0.148885**
1	2997	59848	1574	1422	9863
2	4160	8988	2586	1574	50840
3	5325	8130	3598	1727	1817
4	6491	7272	4609	1881	2794
5	7658	6415	5621	2037	3771
6	8826	5559	6634	2193	4747
7	9996	4704	7646	2350	5723
8	1166	3850	8658	2508	6698
9	2338	2996	9671	2667	7674
0.160	**1.173511**	**0.852144**	**0.160684**	**1.012827**	**0.158649**
1	4685	1292	1696	2989	9623
2	5860	0441	2710	3151	60598
3	7037	49591	3723	3314	1572
4	8214	8742	4736	3478	2545
5	9393	7894	5750	3643	3519
6	80573	7046	6763	3810	4492
7	1754	6200	7777	3977	5465
8	2937	5354	8791	4145	6437
9	4120	4509	9806	4315	7409
0.170	**1.185305**	**0.843665**	**0.170820**	**1.014485**	**0.168381**
1	6491	2822	1835	4656	9353
2	7678	1979	2849	4829	70324
3	8866	1138	3864	5002	1295
4	90056	0297	4879	5176	2265
5	1246	39457	5895	5352	3235
6	2438	8618	6910	5528	4205
7	3631	7780	7926	5705	5175
8	4825	6942	8941	5884	6144
9	6021	6106	9957	6063	7112
0.180	**1.197217**	**0.835270**	**0.180974**	**1.016244**	**0.178081**
1	8415	4435	1990	6425	9049
2	9614	3601	3006	6608	80017
3	200814	2768	4023	6791	0984
4	2016	1936	5040	6976	1951
5	3218	1104	6057	7161	2918
6	4422	0274	7074	7348	3884
7	5627	29444	8092	7536	4850
8	6834	8615	9109	7724	5816
9	8041	7787	90127	7914	6781
0.190	**1.209250**	**0.826959**	**0.191145**	**1.018104**	**0.187746**
1	10459	6133	2163	8296	8711
2	1671	5307	3182	8489	9675
3	2883	4482	4200	8682	90639
4	4096	3658	5219	8877	1602
5	5311	2835	6238	9073	2565
6	6527	2012	7257	9270	3528
7	7744	1191	8277	9467	4490
8	8962	0370	9296	9666	5452
9	20182	19550	200316	9866	6414

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.200	**1.221403**	**0.818731**	**0.201336**	**1.020067**	**0.197375**
1	2625	7912	2356	0269	8336
2	3848	7095	3377	0471	9297
3	5072	6278	4397	0675	200257
4	6298	5462	5418	0880	1216
5	7525	4647	6439	1086	2176
6	8753	3833	7460	1293	3135
7	9983	3020	8481	1501	4093
8	31213	2207	9503	1710	5051
9	2445	1395	10525	1920	6009
0.210	**1.233678**	**0.810584**	**0.211547**	**1.022131**	**0.206966**
1	4912	09774	2569	2343	7923
2	6148	8965	3592	2556	8880
3	7385	8156	4614	2770	9836
4	8623	7348	5637	2986	10792
5	9862	6541	6660	3202	1747
6	41102	5735	7684	3419	2702
7	2344	4930	8707	3637	3657
8	3587	4125	9731	3856	4611
9	4831	3322	20755	4076	5565
0.220	**1.246077**	**0.802519**	**0.221779**	**1.024298**	**0.216518**
1	7323	1717	2803	4520	7471
2	8571	0915	3828	4743	8423
3	9821	0115	4853	4968	9376
4	51071	0.799315	5878	5193	20327
5	2323	8516	6903	5419	1278
6	3576	7718	7929	5647	2229
7	4830	6921	8955	5875	3180
8	6085	6124	9981	6105	4130
9	7342	5329	31007	6335	5079
0.230	**1.258600**	**0.794534**	**0.232033**	**1.026567**	**0.226028**
1	9859	3739	3060	6799	6977
2	61120	2946	4087	7033	7925
3	2381	2154	5114	7268	8873
4	3644	1362	6141	7503	9821
5	4909	0571	7169	7740	30768
6	6174	89781	8197	7977	1714
7	7441	8991	9225	8216	2660
8	8709	8203	40253	8456	3606
9	9979	7415	1282	8697	4551
0.240	**1.271249**	**0.786628**	**0.242311**	**1.028939**	**0.235496**
1	2521	5842	3340	9181	6440
2	3794	5056	4369	9425	7384
3	5069	4272	5399	9670	8327
4	6344	3488	6428	9916	9270
5	7621	2705	7458	30163	40213
6	8900	1922	8489	0411	1155
7	80179	1141	9519	0660	2097
8	1460	0360	50550	0910	3038
9	2742	79580	1581	1161	3978

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.250	**1.284025**	**0.778801**	**0.252612**	**1.031413**	**0.244919**
1	5310	8022	3644	1666	5858
2	6596	7245	4676	1920	6798
3	7883	6468	5708	2176	7737
4	9172	5692	6740	2432	8675
5	90462	4916	7773	2689	9613
6	1753	4142	8805	2947	50550
7	3045	3368	9838	3207	1487
8	4339	2595	60872	3467	2424
9	5634	1823	1905	3728	3360
0.260	**1.296930**	**0.771052**	**0.262939**	**1.033991**	**0.254296**
1	8228	0281	3973	4254	5231
2	9527	69511	5008	4519	6165
3	300827	8742	6042	4784	7099
4	2128	7974	7077	5051	8033
5	3431	7206	8113	5318	8966
6	4735	6439	9148	5587	9899
7	6040	5673	70184	5857	60831
8	7347	4908	1220	6127	1763
9	8655	4143	2256	6399	2694
0.270	**1.309964**	**0.763379**	**0.273292**	**1.036672**	**0.263625**
1	11275	2616	4329	6946	4555
2	2587	1854	5366	7221	5485
3	3900	1093	6404	7497	6414
4	5215	0332	7441	7773	7343
5	6531	59572	8479	8051	8271
6	7848	8813	9517	8330	9199
7	9166	8054	80556	8610	70126
8	20486	7297	1595	8892	1053
9	1807	6540	2634	9174	1979
0.280	**1.323130**	**0.755784**	**0.283673**	**1.039457**	**0.272905**
1	4454	5028	4713	9741	3830
2	5779	4274	5753	40026	4755
3	7105	3520	6793	0312	5679
4	8433	2767	7833	0600	6603
5	9762	2014	8874	0888	7526
6	31092	1263	9915	1178	8449
7	2424	0512	90956	1468	9371
8	3757	49762	1998	1759	80293
9	5092	9012	3040	2052	1214
0.290	**1.336427**	**0.748264**	**0.294082**	**1.042346**	**0.282135**
1	7765	7516	5124	2640	3055
2	9103	6769	6167	2936	3975
3	40443	6022	7210	3232	4894
4	1784	5276	8254	3530	5812
5	3126	4532	9297	3829	6730
6	4470	3787	300341	4129	7648
7	5815	3044	1386	4430	8565
8	7162	2301	2430	4732	9481
9	8510	1559	3475	5035	90397

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.300	**1.349859**	**0.740818**	**0.304520**	**1.045339**	**0.291313**
1	51209	0078	5566	5644	2227
2	2561	39338	6612	5950	3142
3	3914	8599	7658	6257	4056
4	5269	7861	8704	6565	4969
5	6625	7123	9751	6874	5882
6	7982	6387	10798	7184	6794
7	9341	5651	1845	7496	7705
8	60701	4915	2893	7808	8617
9	2062	4181	3941	8122	9527
0.310	**1.363425**	**0.733447**	**0.314989**	**1.048436**	**0.300437**
1	4789	2714	6038	8752	1347
2	6155	1982	7087	9068	2255
3	7522	1250	8136	9386	3164
4	8890	0519	9185	9704	4072
5	70259	29789	20235	50024	4979
6	1630	9059	1285	0345	5886
7	3003	8331	2336	0667	6792
8	4376	7603	3387	0990	7697
9	5751	6876	4438	1313	8602
0.320	**1.377128**	**0.726149**	**0.325489**	**1.051638**	**0.309507**
1	8506	5423	6541	1964	10411
2	9885	4698	7593	2291	1314
3	81265	3974	8646	2620	2217
4	2647	3250	9699	2949	3119
5	4031	2527	30752	3279	4021
6	5415	1805	1805	3610	4922
7	6801	1084	2859	3943	5823
8	8189	0363	3913	4276	6723
9	9578	19643	4967	4610	7622
0.330	**1.390968**	**0.718924**	**0.336022**	**1.054946**	**0.318521**
1	2360	8205	7077	5282	9419
2	3753	7487	8133	5620	20317
3	5147	6770	9189	5959	1214
4	6543	6054	40245	6298	2110
5	7940	5338	1301	6639	3006
6	9339	4623	2358	6981	3902
7	400739	3909	3415	7324	4796
8	2141	3195	4473	7668	5691
9	3543	2482	5530	8013	6584
0.340	**1.404948**	**0.711770**	**0.346589**	**1.058359**	**0.327477**
1	6353	1059	7647	8706	8370
2	7760	0348	8706	9054	9262
3	9169	09638	9765	9403	30153
4	10579	8929	50825	9754	1044
5	1990	8220	1885	60105	1934
6	3403	7512	2945	0458	2823
7	4817	6805	4006	0811	3712
8	6232	6099	5067	1166	4601
9	7649	5393	6128	1521	5488

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.350	**1.419068**	**0.704688**	**0.357190**	**1.061878**	**0.336376**
1	20487	3984	8252	2236	7262
2	1909	3280	9314	2594	8148
3	3331	2577	60377	2954	9033
4	4755	1875	1440	3315	9918
5	6181	1173	2504	3677	40802
6	7608	0473	3567	4040	1686
7	9036	699772	4632	4404	2569
8	30466	9073	5696	4769	3451
9	1897	8374	6761	5136	4333
0.360	**1.433329**	**0.697676**	**0.367827**	**1.065503**	**0.345214**
1	4763	6979	8892	5871	6095
2	6199	6282	9958	6241	6974
3	7636	5586	71025	6611	7854
4	9074	4891	2092	6983	8732
5	40514	4197	3159	7355	9611
6	1955	3503	4226	7729	50488
7	3398	2810	5294	8104	1365
8	4842	2117	6362	8480	2241
9	6288	1425	7431	8857	3117
0.370	**1.447735**	**0.690734**	**0.378500**	**1.069234**	**0.353992**
1	9183	0044	9570	9614	4866
2	50633	89354	80639	9994	5740
3	2084	8665	1710	70375	6613
4	3537	7977	2780	0757	7486
5	4991	7289	3851	1140	8357
6	6447	6602	4922	1525	9229
7	7904	5916	5994	1910	60099
8	9363	5231	7066	2297	0969
9	60823	4546	8139	2684	1839
0.380	**1.462285**	**0.683861**	**0.389212**	**1.073073**	**0.362707**
1	3748	3178	90285	3463	3576
2	5212	2495	1359	3854	4443
3	6678	1813	2433	4245	5310
4	8145	1131	3507	4638	6176
5	9614	0451	4582	5032	7042
6	71085	79771	5657	5428	7907
7	2556	9091	6733	5824	8771
8	4030	8412	7809	6221	9635
9	5505	7734	8885	6619	70498
0.390	**1.476981**	**0.677057**	**0.399962**	**1.077019**	**0.371360**
1	8459	6380	401039	7419	2222
2	9938	5704	2117	7821	3083
3	81418	5029	3195	8224	3944
4	2901	4354	4273	8627	4803
5	4384	3680	5352	9032	5663
6	5869	3007	6431	9438	6521
7	7356	2334	7511	9845	7379
8	8844	1662	8591	80253	8236
9	90334	0991	9671	0662	9093

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.400	**1.491825**	**0.670320**	**0.410752**	**1.081072**	**0.379949**
1	3317	69650	1834	1484	80804
2	4811	8981	2915	1896	1659
3	6307	8312	3997	2309	2513
4	7804	7644	5080	2724	3366
5	9303	6977	6163	3140	4219
6	500803	6310	7246	3556	5071
7	2304	5644	8330	3974	5922
8	3807	4979	9414	4393	6773
9	5312	4314	20499	4813	7623
0.410	**1.506818**	**0.663650**	**0.421584**	**1.085234**	**0.388473**
1	8325	2987	2669	5656	9321
2	9834	2324	3755	6079	90170
3	11345	1662	4841	6504	1017
4	2857	1001	5928	6929	1864
5	4371	0340	7015	7356	2710
6	5886	59680	8103	7783	3555
7	7403	9021	9191	8212	4400
8	8921	8362	30279	8641	5244
9	20440	7704	1368	9072	6088
0.420	**1.521962**	**0.657047**	**0.432457**	**1.089504**	**0.396930**
1	3484	6390	3547	9937	7773
2	5009	5734	4637	90371	8614
3	6534	5079	5728	0806	9455
4	8062	4424	6819	1243	400295
5	9590	3770	7910	1680	1134
6	31121	3116	9002	2119	1973
7	2653	2464	40095	2558	2811
8	4186	1811	1187	2999	3649
9	5721	1160	2281	3440	4485
0.430	**1.537258**	**0.650509**	**0.443374**	**1.093883**	**0.405321**
1	8796	49859	4468	4327	6157
2	40335	9209	5563	4772	6991
3	1876	8560	6658	5218	7825
4	3419	7912	7753	5666	8659
5	4963	7265	8849	6114	9491
6	6509	6618	9946	6563	10323
7	8056	5971	51042	7014	1155
8	9605	5326	2140	7465	1985
9	51155	4681	3237	7918	2815
0.440	**1.552707**	**0.644036**	**0.454335**	**1.098372**	**0.413644**
1	4261	3393	5434	8827	4473
2	5816	2750	6533	9283	5301
3	7372	2107	7633	9740	6128
4	8930	1465	8733	100198	6955
5	60490	0824	9833	0657	7780
6	2051	0184	60934	1118	8605
7	3614	39544	2035	1579	9430
8	5179	8905	3137	2042	20254
9	6745	8266	4239	2505	1077

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.450	**1.568312**	**0.637628**	**0.465342**	**1.102970**	**0.421899**
1	9881	6991	6445	3436	2721
2	71452	6354	7549	3903	3542
3	3024	5718	8653	4371	4362
4	4598	5083	9758	4840	5181
5	6173	4448	70863	5311	6000
6	7750	3814	1968	5782	6818
7	9329	3180	3074	6255	7636
8	80909	2547	4181	6728	8453
9	2491	1915	5288	7203	9269
0.460	**1.584074**	**0.631284**	**0.476395**	**1.107679**	**0.430084**
1	5659	0653	7503	8156	0899
2	7245	0022	8611	8634	1713
3	8833	29393	9720	9113	2526
4	90423	8764	80830	9593	3339
5	2014	8135	1940	10075	4151
6	3607	7507	3050	0557	4962
7	5201	6880	4161	1041	5772
8	6797	6254	5272	1525	6582
9	8395	5628	6384	2011	7391
0.470	**1.599994**	**0.625002**	**0.487496**	**1.112498**	**0.438199**
1	601595	4378	8609	2986	9007
2	3197	3754	9722	3475	9814
3	4801	3130	90836	3966	40620
4	6407	2507	1950	4457	1426
5	8014	1885	3065	4950	2230
6	9623	1263	4180	5443	3034
7	11233	0643	5295	5938	3838
8	2845	0022	6412	6434	4640
9	4459	19402	7528	6931	5442
0.480	**1.616074**	**0.618783**	**0.498646**	**1.117429**	**0.446244**
1	7691	8165	9763	7928	7044
2	9310	7547	500881	8428	7844
3	20930	6930	2000	8930	8643
4	2552	6313	3119	9432	9441
5	4175	5697	4239	9936	50239
6	5800	5082	5359	20441	1036
7	7427	4467	6480	0947	1832
8	9055	3853	7601	1454	2628
9	30685	3239	8723	1962	3422
0.490	**1.632316**	**0.612626**	**0.509845**	**1.122471**	**0.454216**
1	3949	2014	10968	2982	5010
2	5584	1402	2091	3493	5802
3	7221	0791	3215	4006	6594
4	8859	0181	4339	4520	7385
5	40498	09571	5464	5035	8176
6	2140	8962	6589	5551	8966
7	3783	8353	7715	6068	9755
8	5427	7745	8841	6586	60543
9	7073	7137	9968	7105	1330

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.500	**1.648721**	**0.606531**	**0.521095**	**1.127626**	**0.462117**
1	50371	5924	2223	8148	2903
2	2022	5319	3352	8670	3689
3	3675	4714	4481	9194	4473
4	5329	4109	5610	9719	5257
5	6986	3506	6740	30246	6040
6	8643	2902	7870	0773	6823
7	60303	2300	9002	1301	7604
8	1964	1698	30133	1831	8385
9	3627	1096	1265	2362	9166
0.510	**1.665291**	**0.600496**	**0.532398**	**1.132893**	**0.469945**
1	6957	599895	3531	3426	70724
2	8625	9296	4665	3960	1502
3	70295	8697	5799	4496	2279
4	1966	8098	6934	5032	3056
5	3639	7501	8069	5570	3832
6	5313	6903	9205	6108	4607
7	6989	6307	40341	6648	5381
8	8667	5711	1478	7189	6155
9	80346	5115	2616	7731	6928
0.520	**1.682028**	**0.594521**	**0.543754**	**1.138274**	**0.477700**
1	3711	3926	4892	8818	8471
2	5395	3333	6031	9364	9242
3	7081	2740	7171	9910	80012
4	8769	2147	8311	40458	0781
5	90459	1555	9452	1007	1550
6	2150	0964	50593	1557	2318
7	3843	0373	1735	2108	3085
8	5538	89783	2877	2661	3851
9	7234	9194	4020	3214	4616
0.530	**1.698932**	**0.588605**	**0.555164**	**1.143769**	**0.485381**
1	700632	8017	6308	4324	6145
2	2334	7429	7452	4881	6908
3	4037	6842	8597	5439	7671
4	5742	6255	9743	5998	8433
5	7448	5669	60889	6559	9194
6	9157	5084	2036	7120	9954
7	10867	4499	3184	7683	90714
8	2578	3915	4332	8247	1473
9	4292	3331	5480	8812	2231
0.540	**1.716007**	**0.582748**	**0.566629**	**1.149378**	**0.492988**
1	7724	2166	7779	9945	3745
2	9442	1584	8929	50513	4500
3	21163	1003	70080	1083	5256
4	2885	0422	1231	1653	6010
5	4608	579842	2383	2225	6763
6	6334	9262	3536	2798	7516
7	8061	8683	4689	3372	8268
8	9790	8105	5843	3947	9020
9	31521	7527	6997	4524	9770

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.550	**1.733253**	**0.576950**	**0.578152**	**1.155101**	**0.500520**
1	4987	6373	9307	5680	1269
2	6723	5797	80463	6260	2018
3	8461	5222	1620	6841	2765
4	40200	4647	2777	7423	3512
5	1941	4072	3934	8007	4258
6	3684	3498	5093	8591	5004
7	5428	2925	6252	9177	5748
8	7175	2353	7411	9764	6492
9	8923	1781	8571	60352	7235
0.560	**1.750673**	**0.571209**	**0.589732**	**1.160941**	**0.507977**
1	2424	0638	90893	1531	8719
2	4177	0068	2055	2123	9460
3	5932	69498	3217	2715	10200
4	7689	8929	4380	3309	0939
5	9448	8360	5544	3904	1678
6	61208	7792	6708	4500	2416
7	2970	7225	7873	5097	3153
8	4734	6658	9038	5696	3889
9	6500	6091	600204	6295	4624
0.570	**1.768267**	**0.565525**	**0.601371**	**1.166896**	**0.515359**
1	70036	4960	2538	7498	6093
2	1807	4396	3706	8101	6827
3	3580	3831	4874	8706	7559
4	5354	3268	6043	9311	8291
5	7131	2705	7213	9918	9022
6	8909	2142	8383	70525	9752
7	80688	1581	9554	1134	20482
8	2470	1019	10725	1745	1210
9	4253	0459	1897	2356	1938
0.580	**1.786038**	**0.559898**	**0.613070**	**1.172968**	**0.522665**
1	7825	9339	4243	3582	3392
2	9614	8780	5417	4197	4118
3	91405	8221	6592	4813	4842
4	3197	7663	7767	5430	5567
5	4991	7106	8943	6048	6290
6	6787	6549	20119	6668	7013
7	8585	5993	1296	7289	7735
8	800384	5437	2473	7911	8456
9	2185	4882	3652	8534	9176
0.590	**1.803988**	**0.554327**	**0.624831**	**1.179158**	**0.529896**
1	5793	3773	6010	9783	30614
2	7600	3220	7190	80410	1333
3	9409	2667	8371	1038	2050
4	11219	2114	9552	1667	2766
5	3031	1563	30734	2297	3482
6	4845	1011	1917	2928	4197
7	6661	0461	3100	3561	4911
8	8478	49910	4284	4194	5625
9	20298	9361	5468	4829	6338

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.600	**1.822119**	**0.548812**	**0.636654**	**1.185465**	**0.537050**
1	3942	8263	7839	6102	7761
2	5767	7715	9026	6741	8471
3	7593	7168	40213	7381	9181
4	9422	6621	1401	8021	9890
5	31252	6074	2589	8663	40598
6	3084	5529	3778	9307	1305
7	4918	4983	4968	9951	2012
8	6754	4439	6158	90596	2718
9	8592	3894	7349	1243	3423
0.610	**1.840431**	**0.543351**	**0.648540**	**1.191891**	**0.544127**
1	2273	2808	9732	2540	4831
2	4116	2265	50925	3191	5533
3	5961	1723	2119	3842	6235
4	7808	1182	3313	4495	6937
5	9657	0641	4508	5149	7637
6	51507	0101	5703	5804	8337
7	3360	39561	6899	6460	9036
8	5214	9021	8096	7118	9734
9	7070	8483	9294	7776	50431
0.620	**1.858928**	**0.537944**	**0.660492**	**1.198436**	**0.551128**
1	60788	7407	1691	9097	1824
2	2650	6870	2890	9760	2519
3	4513	6333	4090	200423	3213
4	6379	5797	5291	1088	3907
5	8246	5261	6492	1754	4600
6	70115	4726	7694	2421	5292
7	1986	4192	8897	3089	5983
8	3859	3658	70101	3759	6674
9	5734	3125	1305	4429	7363
0.630	**1.877611**	**0.532592**	**0.672509**	**1.205101**	**0.558052**
1	9489	2059	3715	5774	8740
2	81370	1528	4921	6449	9428
3	3252	0996	6128	7124	60114
4	5136	0466	7335	7801	0800
5	7022	29935	8543	8479	1486
6	8910	9406	9752	9158	2170
7	90800	8877	80962	9838	2853
8	2692	8348	2172	10520	3536
9	4585	7820	3383	1203	4218
0.640	**1.896481**	**0.527292**	**0.684594**	**1.211887**	**0.564900**
1	8378	6765	5806	2572	5580
2	900278	6239	7019	3258	6260
3	2179	5713	8233	3946	6939
4	4082	5187	9447	4635	7617
5	5987	4663	90662	5325	8294
6	7894	4138	1878	6016	8971
7	9803	3614	3094	6709	9647
8	11714	3091	4311	7402	70322
9	3626	2568	5529	8097	0996

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.650	**1.915541**	**0.522046**	**0.696748**	**1.218793**	**0.571670**
1	7457	1524	7967	9491	2343
2	9376	1003	9187	20189	3015
3	21296	0482	700407	0889	3686
4	3218	19962	1628	1590	4357
5	5143	9442	2850	2292	5026
6	7069	8923	4073	2996	5695
7	8997	8404	5296	3700	6363
8	30927	7886	6520	4406	7031
9	2859	7368	7745	5113	7698
0.660	**1.934792**	**0.516851**	**0.708970**	**1.225822**	**0.578363**
1	6728	6335	10197	6531	9029
2	8666	5819	1424	7242	9693
3	40605	5303	2651	7954	80356
4	2547	4788	3879	8668	1019
5	4491	4274	5108	9382	1681
6	6436	3760	6338	30098	2343
7	8383	3246	7569	0815	3003
8	50333	2733	8800	1533	3663
9	2284	2221	20032	2252	4322
0.670	**1.954237**	**0.511709**	**0.721264**	**1.232973**	**0.584980**
1	6193	1197	2498	3695	5637
2	8150	0686	3732	4418	6294
3	60109	0176	4967	5142	6950
4	2070	09666	6202	5868	7605
5	4033	9156	7438	6595	8259
6	5998	8648	8675	7323	8913
7	7965	8139	9913	8052	9566
8	9934	7631	31151	8783	90218
9	71905	7124	2390	9514	0869
0.680	**1.973878**	**0.506617**	**0.733630**	**1.240247**	**0.591519**
1	5853	6111	4871	0982	2169
2	7829	5605	6112	1717	2818
3	9808	5099	7354	2454	3466
4	81789	4595	8597	3192	4114
5	3772	4090	9841	3931	4760
6	5757	3586	41085	4671	5406
7	7743	3083	2330	5413	6051
8	9732	2580	3576	6156	6696
9	91723	2078	4822	6900	7339
0.690	**1.993716**	**0.501576**	**0.746070**	**1.247646**	**0.597982**
1	5710	1075	7318	8392	8624
2	7707	0574	8567	9140	9265
3	9706	0074	9816	9890	9906
4	2.001706	499574	51066	50640	600546
5	3709	9074	2317	1392	1184
6	5714	8576	3569	2145	1823
7	7721	8077	4822	2899	2460
8	9729	7579	6075	3654	3097
9	11740	7082	7329	4411	3733

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.700	**2.013753**	**0.496585**	**0.758584**	**1.255169**	**0.604368**
1	5767	6089	9839	5928	5002
2	7784	5593	61096	6689	5636
3	9803	5098	2353	7450	6269
4	21824	4603	3610	8213	6901
5	3847	4109	4869	8978	7532
6	5872	3615	6128	9743	8162
7	7898	3121	7389	60510	8792
8	9927	2628	8649	1278	9421
9	31958	2136	9911	2047	10049
0.710	**2.033991**	**0.491644**	**0.771174**	**1.262818**	**0.610677**
1	6026	1153	2437	3590	1304
2	8063	0662	3701	4363	1929
3	40102	0171	4965	5137	2555
4	2144	89682	6231	5913	3179
5	4187	9192	7497	6689	3803
6	6232	8703	8764	7468	4425
7	8279	8215	80032	8247	5048
8	50328	7727	1301	9028	5669
9	2380	7239	2570	9810	6290
0.720	**2.054433**	**0.486752**	**0.783840**	**1.270593**	**0.616909**
1	6489	6266	5111	1377	7528
2	8546	5780	6383	2163	8147
3	60606	5294	7656	2950	8764
4	2667	4809	8929	3738	9381
5	4731	4325	90203	4528	9997
6	6797	3840	1478	5319	20612
7	8865	3357	2754	6111	1227
8	70935	2874	4030	6904	1840
9	3007	2391	5308	7699	2453
0.730	**2.075081**	**0.481909**	**0.796586**	**1.278495**	**0.623065**
1	7157	1427	7865	9292	3677
2	9235	0946	9144	80091	4287
3	81315	0465	800425	0890	4897
4	3398	79985	1706	1691	5506
5	5482	9505	2988	2494	6115
6	7569	9026	4271	3297	6722
7	9657	8547	5555	4102	7329
8	91748	8069	6839	4908	7935
9	3841	7591	8125	5716	8541
0.740	**2.095936**	**0.477114**	**0.809411**	**1.286525**	**0.629145**
1	8032	6637	10698	7335	9749
2	100132	6161	1985	8146	30352
3	2233	5685	3274	8959	0954
4	4336	5209	4563	9773	1556
5	6441	4734	5854	90588	2157
6	8549	4260	7145	1404	2757
7	10659	3786	8436	2222	3356
8	2770	3312	9729	3041	3954
9	4884	2839	21022	3862	4552

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.750	**2.117000**	**0.472367**	**0.822317**	**1.294683**	**0.635149**
1	9118	1894	3612	5506	5745
2	21238	1423	4908	6331	6341
3	3361	0952	6204	7156	6935
4	5485	0481	7502	7983	7529
5	7612	0011	8800	8811	8122
6	9740	69541	30100	9641	8715
7	31871	9072	1400	300471	9307
8	4004	8603	2701	1303	9897
9	6139	8134	4002	2137	40488
0.760	**2.138276**	**0.467666**	**0.835305**	**1.302971**	**0.641077**
1	40416	7199	6608	3807	1666
2	2557	6732	7913	4645	2253
3	4701	6266	9218	5483	2841
4	6846	5799	40523	6323	3427
5	8994	5334	1830	7164	4013
6	51144	4869	3138	8007	4597
7	3297	4404	4446	8850	5182
8	5451	3940	5756	9696	5765
9	7608	3476	7066	10542	6348
0.770	**2.159766**	**0.463013**	**0.848377**	**1.311390**	**0.646929**
1	61927	2550	9688	2239	7511
2	4090	2088	51001	3089	8091
3	6255	1626	2315	3941	8671
4	8423	1165	3629	4794	9249
5	70592	0704	4944	5648	9827
6	2764	0243	6260	6504	50405
7	4938	59783	7577	7360	0981
8	7114	9324	8895	8219	1557
9	9292	8865	60214	9078	2132
0.780	**2.181472**	**0.458406**	**0.861533**	**1.319939**	**0.652707**
1	3655	7948	2853	20801	3280
2	5840	7490	4175	1665	3853
3	8027	7033	5497	2530	4425
4	90216	6576	6820	3396	4997
5	2407	6120	8144	4263	5567
6	4600	5664	9468	5132	6137
7	6796	5208	70794	6002	6706
8	8994	4753	2120	6874	7275
9	201194	4299	3448	7746	7842
0.790	**2.203396**	**0.453845**	**0.874776**	**1.328621**	**0.658409**
1	5601	3391	6105	9496	8975
2	7808	2938	7435	30373	9541
3	10017	2485	8766	1251	60105
4	2228	2033	80097	2130	0669
5	4441	1581	1430	3011	1232
6	6657	1130	2763	3893	1795
7	8874	0679	4098	4777	2356
8	21094	0229	5433	5661	2917
9	3316	49779	6769	6548	3477

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.800	**2.225541**	**0.449329**	**0.888106**	**1.337435**	**0.664037**
1	7768	8880	9444	8324	4595
2	9996	8431	90783	9214	5153
3	32228	7983	2122	40105	5711
4	4461	7535	3463	0998	6267
5	6696	7088	4804	1892	6823
6	8934	6641	6147	2788	7378
7	41174	6195	7490	3685	7932
8	3417	5749	8834	4583	8485
9	5661	5303	900179	5482	9038
0.810	**2.247908**	**0.444858**	**0.901525**	**1.346383**	**0.669590**
1	50157	4413	2872	7285	70142
2	2408	3969	4220	8189	0692
3	4662	3525	5568	9094	1242
4	6918	3082	6918	50000	1791
5	9176	2639	8268	0907	2339
6	61436	2197	9620	1816	2887
7	3699	1755	10972	2727	3434
8	5963	1313	2325	3638	3980
9	8230	0872	3679	4551	4525
0.820	**2.270500**	**0.440432**	**0.915034**	**1.355466**	**0.675070**
1	2771	39991	6390	6381	5614
2	5045	9552	7747	7299	6157
3	7322	9112	9105	8217	6699
4	9600	8673	20463	9137	7241
5	81881	8235	1823	60058	7782
6	4164	7797	3183	0980	8322
7	6449	7359	4545	1904	8862
8	8737	6922	5907	2829	9401
9	91027	6486	7271	3756	9939
0.830	**2.293319**	**0.436049**	**0.928635**	**1.364684**	**0.680476**
1	5613	5613	30000	5613	1013
2	7910	5178	1366	6544	1548
3	300209	4743	2733	7476	2084
4	2510	4309	4101	8409	2618
5	4814	3874	5470	9344	3152
6	7120	3441	6840	70280	3685
7	9428	3008	8210	1218	4217
8	11739	2575	9582	2157	4748
9	4052	2142	40955	3097	5279
0.840	**2.316367**	**0.431711**	**0.942328**	**1.374039**	**0.685809**
1	8685	1279	3703	4982	6338
2	21004	0848	5078	5926	6867
3	3327	0417	6455	6872	7395
4	5651	29987	7832	7819	7922
5	7978	9557	9210	8768	8448
6	30307	9128	50589	9717	8974
7	2638	8699	1970	80669	9499
8	4972	8271	3351	1621	90023
9	7308	7843	4733	2575	0547

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.850	**2.339647**	**0.427415**	**0.956116**	**1.383531**	**0.691069**
1	41988	6988	7500	4488	1592
2	4331	6561	8885	5446	2113
3	6676	6135	60271	6405	2633
4	9024	5709	1658	7366	3153
5	51374	5283	3046	8329	3673
6	3727	4858	4434	9293	4191
7	6082	4433	5824	90258	4709
8	8439	4009	7215	1224	5226
9	60799	3585	8607	2192	5742
0.860	**2.363161**	**0.423162**	**0.969999**	**1.393161**	**0.696258**
1	5525	2739	71393	4132	6773
2	7892	2317	2788	5104	7287
3	70261	1894	4183	6078	7800
4	2632	1473	5580	7053	8313
5	5006	1052	6977	8029	8825
6	7382	0631	8376	9006	9336
7	9761	0210	9775	9986	9847
8	82142	19790	81176	400966	700357
9	4525	9371	2577	1948	0866
0.870	**2.386911**	**0.418952**	**0.983980**	**1.402931**	**0.701374**
1	9299	8533	5383	3916	1882
2	91689	8114	6787	4902	2389
3	4082	7697	8193	5889	2895
4	6478	7279	9599	6878	3401
5	8875	6862	91007	7869	3906
6	401275	6445	2415	8860	4410
7	3678	6029	3824	9853	4913
8	6083	5613	5235	10848	5416
9	8490	5198	6646	1844	5918
0.880	**2.410900**	**0.414783**	**0.998058**	**1.412841**	**0.706419**
1	3312	4368	9472	3840	6920
2	5726	3954	1.000886	4840	7420
3	8143	3540	2301	5842	7919
4	20563	3127	3718	6845	8418
5	2984	2714	5135	7849	8915
6	5409	2302	6553	8855	9412
7	7835	1890	7973	9862	9909
8	30264	1478	9393	20871	10404
9	2696	1067	10815	1881	0899
0.890	**2.435130**	**0.410656**	**1.012237**	**1.422893**	**0.711394**
1	7566	0245	3660	3906	1887
2	40005	09835	5085	4920	2380
3	2446	9426	6510	5936	2872
4	4890	9016	7937	6953	3364
5	7336	8608	9364	7972	3855
6	9784	8199	20793	8992	4345
7	52235	7791	2222	30013	4834
8	4689	7384	3653	1036	5323
9	7145	6976	5084	2061	5811

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.900	**2.459603**	**0.406570**	**1.026517**	**1.433086**	**0.716298**
1	62064	6163	7950	4114	6784
2	4527	5757	9385	5142	7270
3	6993	5352	30821	6172	7755
4	9461	4947	2257	7204	8240
5	71932	4542	3695	8237	8724
6	4405	4138	5134	9271	9207
7	6881	3734	6574	40307	9689
8	9359	3330	8014	1344	20171
9	81839	2927	9456	2383	0652
0.910	**2.484323**	**0.402524**	**1.040899**	**1.443423**	**0.721132**
1	6808	2122	2343	4465	1612
2	9296	1720	3788	5508	2091
3	91787	1318	5234	6553	2569
4	4280	0917	6681	7599	3047
5	6775	0517	8129	8646	3523
6	9273	0116	9578	9695	4000
7	501774	399716	51029	50745	4475
8	4277	9317	2480	1797	4950
9	6782	8918	3932	2850	5424
0.920	**2.509290**	**0.398519**	**1.055386**	**1.453905**	**0.725897**
1	11801	8121	6840	4961	6370
2	4314	7723	8296	6018	6842
3	6830	7325	9752	7077	7314
4	9348	6928	61210	8138	7784
5	21868	6531	2668	9200	8254
6	4391	6135	4128	60263	8724
7	6917	5739	5589	1328	9192
8	9445	5344	7051	2394	9660
9	31976	4948	8514	3462	30127
0.930	**2.534509**	**0.394554**	**1.069978**	**1.464531**	**0.730594**
1	7045	4159	71443	5602	1060
2	9583	3765	2909	6674	1525
3	42124	3372	4376	7748	1990
4	4668	2979	5844	8823	2453
5	7213	2586	7314	9900	2917
6	9762	2193	8784	70978	3379
7	52313	1801	80256	2057	3841
8	4867	1410	1728	3138	4302
9	7423	1019	3202	4221	4762
0.940	**2.559981**	**0.390628**	**1.084677**	**1.475305**	**0.735222**
1	62543	0237	6153	6390	5681
2	5107	89847	7630	7477	6140
3	7673	9458	9108	8565	6598
4	70242	9068	90587	9655	7055
5	2813	8680	2067	80746	7511
6	5387	8291	3548	1839	7967
7	7964	7903	5031	2934	8422
8	80543	7515	6514	4029	8876
9	3125	7128	7999	5127	9330

x	e^x	e^{-x}	sinh x	cosh x	tanh x
0.950	**2.585710**	**0.386741**	**1.099484**	**1.486225**	**0.739783**
1	8297	6354	100971	7326	40235
2	90886	5968	2459	8427	0687
3	3478	5583	3948	9530	1138
4	6073	5197	5438	90635	1589
5	8671	4812	6929	1741	2038
6	601271	4428	8422	2849	2487
7	3873	4043	9915	3958	2936
8	6478	3659	11409	5069	3383
9	9086	3276	2905	6181	3830
0.960	**2.611696**	**0.382893**	**1.114402**	**1.497295**	**0.744277**
1	4309	2510	5900	8410	4723
2	6925	2128	7399	9526	5168
3	9543	1746	8899	500645	5612
4	22164	1364	20400	1764	6056
5	4788	0983	1902	2885	6499
6	7414	0602	3406	4008	6941
7	30042	0222	4910	5132	7383
8	2674	79842	6416	6258	7824
9	5308	9462	7923	7385	8265
0.970	**2.637944**	**0.379083**	**1.129431**	**1.508514**	**0.748704**
1	40584	8704	30940	9644	9143
2	3226	8326	2450	10776	9582
3	5870	7947	3961	1909	50020
4	8517	7570	5474	3044	0457
5	51167	7192	6987	4180	0893
6	3820	6815	8502	5318	1329
7	6475	6439	40018	6457	1764
8	9133	6062	1535	7598	2199
9	61793	5687	3053	8740	2633
0.980	**2.664456**	**0.375311**	**1.144573**	**1.519884**	**0.753066**
1	7122	4936	6093	21029	3498
2	9790	4561	7615	2176	3930
3	72462	4187	9137	3324	4362
4	5135	3813	50661	4474	4792
5	7812	3439	2186	5626	5222
6	80491	3066	3713	6779	5652
7	3173	2693	5240	7933	6080
8	5857	2321	6768	9089	6508
9	8545	1948	8298	30247	6936
0.990	**2.691234**	**0.371577**	**1.159829**	**1.531406**	**0.757362**
1	3927	1205	61361	2566	7788
2	6622	0834	2894	3728	8214
3	9320	0464	4428	4892	8639
4	702021	0093	5964	6057	9063
5	4724	69723	7500	7224	9486
6	7430	9354	9038	8392	9909
7	10139	8985	70577	9562	60331
8	2851	8616	2117	40733	0753
9	5565	8248	3659	1906	1174

x	e^x	e^{-x}	sinh x	cosh x	tanh x
1.000	**2.718282**	**0.367879**	**1.175201**	**1.543081**	**0.761594**
2	23724	7144	78290	45434	2433
4	29177	6411	1383	47794	3269
6	34641	5679	84481	50160	4103
8	40115	4948	87584	52532	4934
10	45601	4219	90691	54910	5762
2	51098	3491	93803	57294	6588
4	56605	2765	96920	59685	7411
6	62124	2040	200042	62082	8232
8	67654	1317	03169	64485	9051
1.020	**2.773195**	**0.360595**	**1.206300**	**1.566895**	**0.769867**
2	78747	59874	09436	69311	70680
4	84310	9155	12577	71733	1491
6	89884	8438	15723	74161	2299
8	95469	7722	18874	76595	3105
30	801066	7007	22029	79036	3908
2	06674	6294	25190	81484	4709
4	12293	5582	28355	83937	5508
6	17923	4871	31526	86397	6304
8	23564	4162	34701	88863	7097
1.040	**2.829217**	**0.353455**	**1.237881**	**1.591336**	**0.777888**
2	34881	2748	41066	93815	8677
4	40557	2044	44256	96300	9463
6	46243	1340	47452	98792	80246
8	51942	0638	50652	601290	1028
50	57651	49938	53857	03794	1806
2	63372	9239	57067	06305	2583
4	69105	8541	60282	08823	3357
6	74849	7844	63502	11346	4128
8	80604	7149	66727	13877	4897
1.060	**2.886371**	**0.346456**	**1.269958**	**1.616413**	**0.785664**
2	92150	5764	73193	18957	6428
4	97940	5073	76433	21506	7190
6	903741	4383	79679	24062	7949
8	09555	3695	82930	26625	8707
70	15379	3009	86185	29194	9461
2	21216	2323	89446	31770	90214
4	27064	1639	92713	34352	0963
6	32924	0957	95984	36940	1711
8	38796	0275	99260	39536	2456
1.080	**2.944680**	**0.339596**	**1.302542**	**1.642138**	**0.793199**
2	50575	8917	05829	44746	3940
4	56482	8240	09121	47361	4678
6	62401	7564	12418	49982	5414
8	68331	6890	15721	52611	6147
90	74274	6216	19029	55245	6878
2	80229	5545	22342	57887	7607
4	86195	4874	25660	60535	8333
6	92173	4205	28984	63189	9058
8	98164	3537	32313	65851	9779

x	e^x	e^{-x}	sinh x	cosh x	tanh x
1.100	**3.004166**	**0.332871**	**1.335647**	**1.668519**	**0.800499**
2	10180	2206	38987	71193	1216
4	16207	1542	42332	73875	1931
6	22245	0880	45683	76563	2644
8	28296	0219	49039	79257	3354
10	34358	29559	52400	81959	4062
2	40433	8901	55766	84667	4768
4	46520	8243	59138	87382	5472
6	52619	7588	62516	90103	6173
8	58731	6933	65899	92832	6872
1.120	**3.064854**	**0.326280**	**1.369287**	**1.695567**	**0.807569**
2	70990	5628	72681	98309	8263
4	77138	4977	76080	701058	8956
6	83299	4328	79485	03813	9646
8	89471	3680	82896	06576	10334
30	95657	3033	86312	09345	1019
2	101854	2388	89733	12121	1703
4	08064	1744	93160	14904	2384
6	14286	1101	96593	17694	3063
8	20521	0459	400031	20490	3740
1.140	**3.126768**	**0.319819**	**1.403475**	**1.723294**	**0.814414**
2	33028	9180	06924	26104	5086
4	39300	8542	10379	28921	5757
6	45585	7906	13840	31746	6425
8	51883	7271	17306	34577	7090
50	58193	6637	20778	37415	7754
2	64516	6004	24256	40260	8416
4	70851	5373	27739	43112	9075
6	77199	4743	31228	45971	9732
8	83560	4114	34723	48837	20387
1.160	**3.189933**	**0.313486**	**1.438224**	**1.751710**	**0.821040**
2	96320	2860	41730	54590	1691
4	202719	2235	45242	57477	2339
6	09130	1611	48760	60371	2986
8	15555	0988	52283	63272	3630
70	21993	0367	55813	66180	4272
2	28443	09747	59348	69095	4912
4	34906	9128	62889	72017	5550
6	41383	8510	66436	74947	6186
8	47872	7894	69989	77883	6820
1.180	**3.254374**	**0.307279**	**1.473548**	**1.780826**	**0.827452**
2	60889	6665	77112	83777	8081
4	67418	6052	80683	86735	8709
6	73959	5441	84259	89700	9334
8	80514	4830	87842	92672	9958
90	87081	4221	91430	95651	30579
2	93662	3613	95024	98638	1198
4	300256	3007	98625	801631	1815
6	06863	2401	502231	04632	2430
8	13483	1797	05843	07640	3044

x	e^x	e^{-x}	sinh x	cosh x	tanh x
1.200	**3.320117**	**0.301194**	**1.509461**	**1.810656**	**0.833655**
2	26764	0592	13086	13678	4264
4	33424	.299992	16716	16708	4871
6	40098	9392	20353	19745	5476
8	46784	8794	23995	22789	6079
10	53485	8197	27644	25841	6679
2	60198	7601	31298	28900	7278
4	66925	7007	34959	31966	7875
6	73666	6413	38626	35040	8470
8	80420	5821	42299	38121	9063
1.220	**3.387188**	**0.295230**	**1.545979**	**1.841209**	**0.839654**
2	93969	4640	49664	44305	40243
4	400764	4052	53356	47408	0830
6	07572	3464	57054	50518	1415
8	14394	2878	60758	53636	1998
30	21230	2293	64468	56761	2579
2	28079	1709	68185	59894	3158
4	34942	1126	71908	63034	3736
6	41819	0544	75637	66181	4311
8	48709	89964	79373	69336	4884
1.240	**3.455613**	**0.289384**	**1.583115**	**1.872499**	**0.845456**
2	62532	8806	86863	75669	6025
4	69464	8229	90617	78846	6593
6	76409	7653	94378	82031	7158
8	83369	7078	98145	85224	7722
50	90343	6505	601919	88424	8284
2	97331	5932	05699	91631	8844
4	504332	5361	09486	94847	9402
6	11348	4791	13279	98069	9958
8	18378	4222	17078	901300	50512
1.260	**3.525421**	**0.283654**	**1.620884**	**1.904538**	**0.851064**
2	32479	3087	24696	07783	1615
4	39551	2522	28515	11037	2163
6	46638	1957	32340	14297	2710
8	53738	1394	36172	17566	3255
70	60853	0832	40010	20842	3798
2	67981	0271	43855	24126	4339
4	75124	79711	47707	27418	4878
6	82282	9152	51565	30717	5416
8	89454	8594	55430	34024	5951
1.280	**3.596640**	**0.278037**	**1.659301**	**1.937339**	**0.856485**
2	603840	7482	63179	40661	7017
4	11055	6927	67064	43991	7547
6	18284	6374	70955	47329	8075
8	25528	5822	74853	50675	8602
90	32787	5271	78758	54029	9127
2	40059	4721	82669	57390	9649
4	47347	4172	86587	60759	60171
6	54649	3624	90512	64136	0690
8	61965	3077	94444	67521	1207

x	e^x	e^{-x}	sinh x	cosh x	tanh x
1.300	**3.669297**	**0.272532**	**1.698382**	**1.970914**	**0.861723**
2	76643	1987	702328	74315	2237
4	84003	1444	06280	77724	2749
6	91379	0901	10239	81140	3260
8	98769	0360	14204	84565	3768
10	706174	69820	18177	87997	4275
2	13593	9281	22156	91437	4781
4	21028	8743	26143	94886	5284
6	28478	8206	30136	98342	5786
8	35942	7670	34136	2.001806	6286
1.320	**3.743421**	**0.267135**	**1.738143**	**2.005278**	**0.866784**
2	50916	6602	42157	08759	7280
4	58425	6069	46178	12247	7775
6	65949	5537	50206	15743	8268
8	73489	5007	54241	19248	8760
30	81043	4477	58283	22760	9249
2	88613	3949	62332	26281	9737
4	96198	3421	66388	29810	70224
6	803798	2895	70451	33346	0708
8	11413	2370	74522	36891	1191
1.340	**3.819044**	**0.261846**	**1.778599**	**2.040445**	**0.871672**
2	26689	1323	82683	44006	2152
4	34350	0800	86775	47575	2630
6	42027	0279	90874	51153	3106
8	49718	59759	94980	54739	3580
50	57426	9240	99093	58333	4053
2	65148	8722	803213	61935	4525
4	72886	8205	07340	65546	4994
6	80640	7689	11475	69165	5462
8	88409	7175	15617	72792	5928
1.360	**3.896193**	**0.256661**	**1.819766**	**2.076427**	**0.876393**
2	903993	6148	23923	80071	6856
4	11809	5636	28087	83723	7318
6	19641	5125	32258	87383	7777
8	27488	4616	36436	91052	8236
70	35351	4107	40622	94729	8692
2	43229	3599	44815	98414	9147
4	51124	3093	49016	102108	9601
6	59034	2587	53223	05810	80052
8	66960	2082	57439	09521	0503
1.380	**3.974902**	**0.251579**	**1.861662**	**2.113240**	**0.880951**
2	82859	1076	65892	16968	1398
4	90833	0574	70129	20704	1844
6	98823	0074	74375	24448	2288
8	4.006828	49574	78627	28201	2730
90	14850	9075	82887	31963	3171
2	22888	8578	87155	35733	3610
4	30942	8081	91430	39511	4048
6	39012	7585	95713	43298	4484
8	47098	7091	900004	47094	4919

x	e^x	e^{-x}	$\sinh x$	$\cosh x$	$\tanh x$
1.400	**4.055200**	**0.246597**	**1.904302**	**2.150898**	**0.885352**
2	63318	6104	08607	54711	5783
4	71453	5613	12920	58533	6213
6	79604	5122	17241	62363	6642
8	87772	4632	21570	66202	7069
10	95955	4143	25906	70049	7494
2	104156	3655	30250	73905	7918
4	12372	3169	34602	77770	8341
6	20605	2683	38961	81644	8761
8	28854	2198	43328	85526	9181
1.420	**4.137120**	**0.241714**	**1.947703**	**2.189417**	**0.889599**
2	45403	1231	52086	93317	90015
4	53702	0749	56476	97226	0430
6	62018	0268	60875	201143	0844
8	70350	39788	65281	05069	1256
30	78699	9309	69695	09004	1667
2	87065	8831	74117	12948	2076
4	95447	8354	78547	16901	2483
6	4.203847	7877	82985	20862	2890
8	12263	7402	87430	24832	3294
1.440	**4.220696**	**0.236928**	**1.991884**	**2.228812**	**0.893698**
2	29146	6454	96346	32800	4100
4	37612	5982	2.000815	36797	4500
6	46096	5510	05293	40803	4899
8	54597	5040	09778	44818	5297
50	63115	4570	14272	48842	5693
2	71649	4102	18774	52875	6088
4	80201	3634	23284	56918	6481
6	88770	3167	27802	60969	6873
8	97356	2701	32328	65029	7263
1.460	**4.305960**	**0.232236**	**2.036862**	**2.269098**	**0.897653**
2	14580	1772	41404	73176	8040
4	23218	1309	45954	77264	8427
6	31873	0847	50513	81360	8812
8	40545	0386	55080	85466	9195
70	49235	29925	59655	89580	9577
2	57942	9466	64238	93704	9958
4	66667	9008	68830	97837	900338
6	75409	8550	73429	301980	0716
8	84169	8093	78038	06131	1093
1.480	**4.392946**	**0.227638**	**2.082654**	**2.310292**	**0.901468**
2	401740	7183	87279	14462	1842
4	10553	6729	91912	18641	2215
6	19383	6276	96553	22829	2586
8	28230	5824	101203	27027	2956
90	37096	5373	05861	31234	3325
2	45979	4922	10528	35450	3692
4	54879	4473	15203	39676	4058
6	63798	4024	19887	43911	4423
8	72735	3577	24579	48156	4786

x	e^x	e^{-x}	sinh x	cosh x	tanh x
1.500	**4.481689**	**0.223130**	**2.129279**	**2.352410**	**0.905148**
2	90661	2684	33989	56673	5509
4	99652	2239	38706	60946	5868
6	508660	1795	43432	65228	6227
8	17686	1352	48167	69519	6583
10	26731	0910	52910	73820	6939
2	35793	0469	57662	78131	7293
4	44874	0028	62423	82451	7646
6	53973	19588	67192	86781	7998
8	63090	9150	71970	91120	8348
1.520	**4.572225**	**0.218712**	**2.176757**	**2.395469**	**0.908698**
2	81379	8275	81552	99827	9046
4	90551	7839	86356	404195	9392
6	99741	7404	91169	08572	9738
8	08950	6969	95990	12959	10082
30	618177	6536	200821	17356	0425
2	27422	6103	05660	21763	0766
4	36687	5671	10508	26179	1107
6	45969	5240	15364	30605	1446
8	55270	4810	20230	35040	1784
1.540	**4.664590**	**0.214381**	**2.225105**	**2.439486**	**0.912120**
2	73929	3953	29988	43941	2456
4	83286	3525	34880	48406	2790
6	92662	3099	39782	52880	3123
8	702057	2673	44692	57365	3455
50	11470	2248	49611	61859	3785
2	20903	1824	54539	66363	4115
4	30354	1401	59477	70877	4443
6	39824	0978	64423	75401	4770
8	49313	0557	69378	79935	5096
1.560	**4.758821**	**0.210136**	**2.274343**	**2.484479**	**0.915420**
2	68348	09716	79316	89032	5744
4	77895	9297	84299	93596	6066
6	87460	8879	89290	98170	6387
8	97045	8462	94291	502753	6707
70	806648	8045	99302	07347	7026
2	16271	7630	304321	11950	7343
4	25913	7215	09349	16564	7660
6	35575	6801	14387	21188	7975
8	45256	6387	19434	25822	8289
1.580	**4.854956**	**0.205975**	**2.324490**	**2.530465**	**0.918602**
2	64675	5564	29556	35119	8914
4	74415	5153	34631	39784	9224
6	84173	4743	39715	44458	9534
8	93951	4334	44809	49143	9842
90	903749	3926	49912	53837	20149
2	13566	3518	55024	58542	0455
4	23403	3112	60146	63257	0760
6	33260	2706	65277	67983	1064
8	43136	2301	70418	72718	1367

x	e^x	e^{-x}	sinh x	cosh x	tanh x
1.600	**4.953032**	**0.201897**	**2.375568**	**2.577464**	**0.921669**
2	62948	1493	80728	82221	1969
4	72884	1091	85897	86987	2268
6	82840	0689	91076	91764	2567
8	92816	0288	96264	96552	2864
10	5.002811	199888	401462	601349	3160
2	12827	9488	06669	06158	3455
4	22863	9090	11886	10976	3749
6	32918	8692	17113	15805	4042
8	42994	8295	22350	20645	4334
1.620	**5.053090**	**0.197899**	**2.427596**	**2.625495**	**0.924624**
2	63207	7503	32852	30355	4914
4	73343	7109	38117	35226	5202
6	83500	6715	43393	40107	5490
8	93677	6322	48678	44999	5776
30	103875	5930	53973	49902	6062
2	14093	5538	59277	54815	6346
4	24331	5147	64592	59739	6629
6	34590	4758	69916	64674	6911
8	44869	4368	75251	69619	7192
1.640	**5.155170**	**0.193980**	**2.480595**	**2.674575**	**0.927473**
2	65490	3592	85949	79541	7752
4	75831	3206	91313	84519	8030
6	86194	2820	96687	89507	8307
8	96576	2434	502071	94505	8583
50	206980	2050	07465	99515	8858
2	17404	1666	12869	704535	9132
4	27849	1283	18283	09566	9404
6	38316	0901	23707	14608	9676
8	48803	0520	29142	19661	9947
1.660	**5.259311**	**0.190139**	**2.534586**	**2.724725**	**0.930217**
2	69840	89759	40040	29800	0486
4	80390	9380	45505	34885	0754
6	90962	9002	50980	39982	1021
8	301554	8624	56465	45089	1287
70	312168	8247	61960	50207	1552
2	22803	7871	67466	55337	1816
4	33459	7496	72982	60477	2079
6	44137	7121	78508	65629	2341
8	54836	6747	84044	70791	2602
1.680	**5.365556**	**0.186374**	**2.589591**	**2.775965**	**0.932862**
2	76298	6002	95148	81150	3121
4	87061	5630	600716	86346	3379
6	97846	5259	06294	91553	3636
8	408653	4889	11882	96771	3892
90	19481	4520	17481	802000	4147
2	30331	4151	23090	07241	4401
4	41202	3783	28710	12492	4655
6	52095	3416	34340	17756	4907
8	63010	3049	39981	23030	5159

x	e^x	e^{-x}	sinh x	cosh x	tanh x
1.700	**5.473947**	**0.182684**	**2.645632**	**2.828315**	**0.935409**
2	84906	2319	51294	33612	5659
4	95887	1954	56966	38921	5907
6	506890	1591	62650	44240	6155
8	17915	1228	68343	49571	6402
10	28961	0866	74048	54914	6648
2	40030	0504	79763	60267	6892
4	51122	0144	85489	65633	7136
6	62235	79784	91226	71009	7380
8	73371	9425	96973	76398	7622
1.720	**5.584528**	**0.179066**	**2.702731**	**2.881797**	**0.937863**
2	95709	8708	08500	87209	8103
4	606911	8351	14280	92631	8343
6	18136	7995	20071	98066	8581
8	29384	7639	25872	903512	8819
30	40654	7284	31685	08969	9056
2	51947	6930	37508	14438	9292
4	63262	6577	43343	19919	9527
6	74600	6224	49188	25412	9761
8	85960	5872	55044	30916	9994
1.740	**5.697343**	**0.175520**	**2.760912**	**2.936432**	**0.940227**
2	708750	5170	66790	41960	0458
4	20178	4820	72679	47499	0689
6	31630	4470	78580	53050	0919
8	43105	4122	84492	58613	1147
50	54603	3774	90414	64188	1376
2	66123	3427	96348	69775	1603
4	77667	3080	802293	75374	1829
6	89234	2734	08250	80984	2055
8	800824	2389	14217	86607	2279
1.760	**5.812437**	**0.172045**	**2.820196**	**2.992241**	**0.942503**
2	24074	1701	26186	97888	2726
4	35734	1358	32188	3.003546	2948
6	47417	1016	38201	09216	3169
8	59123	0674	44225	14899	3390
70	70853	0333	50260	20593	3609
2	82607	69993	56307	26300	3828
4	94384	9653	62365	32018	4046
6	906184	9314	68435	37749	4263
8	18009	8976	74516	43492	4480
1.780	**5.929856**	**0.168638**	**2.880609**	**3.049247**	**0.944695**
2	41728	8301	86713	55015	4910
4	53623	7965	92829	60794	5124
6	65543	7629	98957	66586	5337
8	77486	7294	905096	72390	5549
90	89452	6960	11246	78206	5761
2	6.001443	6627	17408	84035	5971
4	13458	6294	23582	89876	6181
6	25497	5961	29768	95729	6390
8	37560	5630	35965	101595	6598

x	e^x	e^{-x}	$\sinh x$	$\cosh x$	$\tanh x$
1.800	**6.049647**	**0.165299**	**2.942174**	**3.107473**	**0.946806**
2	61759	4969	48395	13364	7013
4	73895	4639	54628	19267	7219
6	86054	4310	60872	25182	7424
8	98239	3982	67128	31110	7628
10	110447	3654	73397	37051	7832
2	22681	3327	79677	43004	8035
4	34938	3001	85969	48969	8237
6	47220	2675	92273	54948	8438
8	59527	2350	98588	60939	8639
1.820	**6.171858**	**0.162026**	**3.004916**	**3.166942**	**0.948838**
2	84215	1702	11256	72958	9037
4	96595	1379	17608	78987	9236
6	209001	1057	23972	85029	9433
8	21431	0735	30348	91083	9630
30	33887	0414	36737	97150	9826
2	46367	0093	43137	203230	50021
4	58872	59773	49549	09323	0216
6	71402	9454	55974	15428	0410
8	83958	9135	62411	21547	0603
1.840	**6.296538**	**0.158817**	**3.068860**	**3.227678**	**0.950795**
2	309144	8500	75322	33822	0987
4	21775	8183	81796	39979	1178
6	34431	7867	88282	46149	1368
8	47113	7552	94780	52332	1557
50	59820	7237	101291	58528	1746
2	72552	6923	07814	64737	1934
4	85310	6609	14350	70960	2121
6	98093	6297	20898	77195	2308
8	410902	5984	27459	83443	2494
1.860	**6.423737**	**0.155673**	**3.134032**	**3.289705**	**0.952679**
2	36597	5362	40618	95979	2863
4	49483	5051	47216	302267	3047
6	62395	4741	53827	08568	3230
8	75333	4432	60450	14882	3412
70	88296	4124	67086	21210	3594
2	501286	3816	73735	27551	3775
4	14302	3508	80397	33905	3955
6	27343	3202	87071	40272	4135
8	40411	2896	93758	46653	4314
1.880	**6.553505**	**0.152590**	**3.200457**	**3.353047**	**0.954492**
2	66625	2285	07170	59455	4670
4	79771	1981	13895	65876	4847
6	92944	1677	20633	72311	5023
8	606143	1374	27384	78759	5198
90	19369	1072	34148	85220	5373
2	32621	0770	40925	91695	5547
4	45899	0469	47715	98184	5721
6	59204	0168	54518	404686	5894
8	72536	49868	61334	11202	6066

x	e^x	e^{-x}	$\sinh x$	$\cosh x$	$\tanh x$
1.900	**6.685894**	**0.149569**	**3.268163**	**3.417732**	**0.956237**
2	99280	9270	75005	24275	6408
4	712692	8972	81860	30832	6579
6	26130	8674	88728	37402	6748
8	39596	8377	95610	43986	6917
10	53089	8080	302504	50585	7085
2	66608	7785	09412	57197	7253
4	80155	7489	16333	63822	7420
6	93729	7195	23267	70462	7586
8	807330	6900	30215	77115	7752
1.920	**6.820958**	**0.146607**	**3.337176**	**3.483783**	**0.957917**
2	34614	6314	44150	90464	8082
4	48297	6022	51138	97159	8246
6	62007	5730	58139	503869	8409
8	75745	5439	65153	10592	8571
30	89510	5148	72181	17329	8733
2	903303	4858	79222	24081	8895
4	17123	4569	86277	30846	9055
6	30972	4280	93346	37626	9216
8	44847	3992	400428	44420	9375
1.940	**6.958751**	**0.143704**	**3.407524**	**3.551227**	**0.959534**
2	72682	3417	14633	58050	9692
4	86642	3130	21756	64886	9850
6	7.000629	2844	28892	71737	60007
8	14644	2559	36043	78602	0164
50	28688	2274	43207	85481	0319
2	42759	1990	50385	92374	0475
4	56859	1706	57576	99282	0629
6	70986	1423	64782	606205	0783
8	85143	1140	72001	13142	0937
1.960	**7.099327**	**0.140858**	**3.479234**	**20093**	**0.961090**
2	113540	0577	86481	27058	1242
4	27781	0296	93743	34039	1394
6	42051	0016	501018	41033	1545
8	56349	39736	08307	48043	1696
70	70676	9457	15610	55067	1846
2	85032	9178	22927	62105	1995
4	99417	8900	30258	69158	2144
6	213830	8623	37604	76226	2292
8	28272	8346	44963	83309	2440
1.980	**7.242743**	**0.138069**	**3.552337**	**3.690406**	**0.962587**
2	57243	7793	59725	97518	2734
4	71772	7518	67127	704645	2880
6	86330	7243	74543	11787	3025
8	300917	6969	81974	18943	3170
90	15534	6695	89419	26115	3314
2	30179	6422	96879	33301	3458
4	44854	6150	604352	40502	3601
6	59559	5878	11841	47718	3744
8	74293	5606	19343	54949	3886

x	e^x	e^{-x}	sinh x	cosh x	tanh x
2.000	**7.389056**	**0.135335**	**3.626860**	**3.762196**	**0.964028**
05	426094	4660	3.645717	80377	4379
10	63317	3989	3.664664	98653	4727
15	500727	3320	83703	817024	5072
20	38325	2655	702835	35490	5414
25	76111	1994	22059	54052	5752
30	614086	1336	41375	72711	6087
35	52252	0680	60786	91466	6419
40	90609	0029	80290	910319	6747
45	729159	29380	99889	29269	7073
2.050	**7.767901**	**0.128735**	**3.819583**	**3.948318**	**0.967395**
55	806838	8093	39373	67465	7714
60	45970	7454	59258	86712	8030
65	85298	6818	79240	4.006058	8343
70	924823	6186	99319	25504	8653
75	64546	5556	919495	45051	8960
80	8.004469	4930	39769	64700	9265
85	44591	4307	60142	84449	9566
90	84915	3687	80614	104301	9864
95	125441	3070	4.001185	24256	70159
2.100	**8.166170**	**0.122456**	**4.021857**	**4.144313**	**0.970452**
05	207103	1846	042629	64474	0742
10	48241	1238	63502	84740	1029
15	89586	0633	84476	205110	1313
20	331137	0032	105553	25585	1594
25	72897	19433	26732	46165	1873
30	414867	8837	48015	66852	2149
35	57047	8245	69401	87646	2422
40	99438	7655	90891	308546	2693
45	542041	7068	212487	29555	2961
2.150	**8.584858**	**0.116484**	**4.234187**	**4.350671**	**0.973226**
55	627890	5903	55993	71897	3489
60	71138	5325	77906	93231	3749
65	714602	4750	99926	414676	4007
70	58284	4178	322053	36231	4262
75	802185	3608	44288	57897	4515
80	46306	3042	66632	79674	4766
85	90649	2478	89085	501563	5014
90	935213	1917	411648	23565	5259
95	80001	1359	34321	45680	5502
2.200	**9.025013**	**0.110803**	**4.457105**	**4.567908**	**0.975743**
05	70252	0251	80001	90251	5982
10	115716	09701	503008	612709	6218
15	61409	9154	26128	35281	6452
20	207331	8609	49361	57970	6683
25	53483	8067	72708	80775	6912
30	99866	7528	96169	703697	7140
35	346482	6992	619745	26737	7364
40	93331	6459	43436	49895	7587
45	440416	5928	67244	73172	7808

x	e^x	e^{-x}	sinh x	cosh x	tanh x
2.250	**9.487736**	**0.105399**	**4.691168**	**4.796568**	**0.978026**
55	535293	4874	715210	820083	8242
60	83089	4350	739369	843720	8457
65	631125	3830	763647	867477	8669
70	79401	3312	788044	891356	8879
75	727919	2797	812556	915358	9086
80	76680	2284	837198	939482	9293
85	825686	1774	861956	963730	9496
90	74938	1266	886836	988102	9698
95	924436	0761	911837	5.012599	9898
2.300	**9.974182**	**0.100259**	**4.936962**	**5.037221**	**0.980096**
05	10.024178	99759	962210	061969	0292
10	74425	9261	987582	086843	0487
15	124923	8766	5.013078	111845	0679
20	75674	8274	038700	136974	0869
25	226680	7783	064448	162232	1058
30	77942	7296	090323	187619	1245
35	329460	6810	116325	213135	1430
40	81237	6328	142454	238782	1613
45	433273	5847	168713	264560	1794
2.350	**10.485570**	**0.095369**	**5.195100**	**5.290469**	**0.981973**
55	538129	4894	221618	316511	2151
60	90951	4420	248266	342686	2327
65	644039	3949	275045	368994	2502
70	97392	3481	301956	395437	2674
75	751013	3014	328999	422014	2845
80	804903	2551	356176	448727	3014
85	59063	2089	383487	475576	3182
90	913494	1630	410932	502562	3348
95	68198	1173	438513	529685	3512
2.400	**11.023176**	**0.090718**	**5.466229**	**5.556947**	**0.983675**
05	78430	0265	494082	584348	3836
10	133961	89815	522073	611888	3996
15	89770	9367	550202	639569	4154
20	245859	8922	578469	667390	4310
25	302229	8478	606876	695354	4465
30	58882	8037	635423	723459	4618
35	415819	7598	664110	751708	4770
40	73041	7161	692940	780101	4921
45	530550	6726	721912	808638	5069
2.450	**11.588347**	**0.086294**	**5.751027**	**5.837320**	**0.985217**
55	646434	5863	780285	866148	5363
60	704812	5435	809688	895123	5508
65	63482	5009	839237	924245	5651
70	822447	4585	868931	953516	5792
75	81707	4163	898772	982935	5933
80	941264	3743	928761	6.012504	6072
85	12.001120	3326	958897	042223	6209
90	61276	2910	989183	072093	6346
95	121734	2496	019619	102115	6481

x	e^x	e^{-x}	$\sinh x$	$\cosh x$	$\tanh x$
2.500	**12.182494**	**0.082085**	**6.050204**	**6.132289**	**0.986614**
05	243559	1676	080942	162617	6747
10	304930	1268	111831	193099	6878
15	366609	0863	142873	223736	7007
20	428597	0460	174069	254528	7136
25	490895	0058	205418	285477	7263
30	553506	79659	236924	316583	7389
35	616431	9262	268585	347846	7514
40	679671	8866	300402	379269	7637
45	743228	8473	332378	410851	7759
2.550	**12.807104**	**0.078082**	**6.364511**	**6.442593**	**0.987880**
55	871300	7692	396804	474496	8000
60	935817	7305	429256	506561	8119
65	13.000658	6919	461870	538789	8236
70	065824	6536	494644	571180	8353
75	131317	6154	527582	603735	8468
80	197138	5774	560682	636456	8582
85	263289	5396	593947	669343	8695
90	329772	5020	627376	702396	8807
95	396587	4646	660971	735617	8918
2.600	**13.463738**	**0.074274**	**6.694732**	**6.769006**	**0.989027**
05	531225	3903	728661	802564	9136
10	599051	3535	762758	836293	9244
15	667216	3168	797024	870192	9350
20	735724	2803	831460	904263	9455
25	804574	2440	866067	938507	9560
30	873770	2078	900846	972924	9663
35	943312	1719	935797	7.007516	9765
40	14.013204	1361	970921	042282	9867
45	083445	1005	7.006220	077225	9967
2.650	**14.154039**	**0.070651**	**7.041694**	**7.112345**	**0.990066**
55	224986	0299	077344	147642	0165
60	296289	69948	113170	183119	0262
65	367950	9599	149175	218774	0359
70	439969	9252	185358	254611	0454
75	512350	8907	221722	290628	0549
80	585093	8563	258265	326828	0642
85	658201	8221	294990	363211	0735
90	731676	7881	331897	399778	0827
95	805519	7542	368988	436531	0917
2.700	**14.879732**	**0.067206**	**7.406263**	**7.473469**	**0.991007**
05	954317	6870	443723	510594	1097
10	15.029276	6537	481369	547906	1185
15	104610	6205	519203	585408	1272
20	180322	5875	557224	623098	1359
25	256414	5546	595434	660980	1444
30	332887	5219	633834	699053	1529
35	409743	4894	672425	737319	1613
40	486985	4570	711207	775778	1696
45	564614	4248	750183	814431	1778

x	e^x	e^{-x}	sinh x	cosh x	tanh x
2.750	**15.642632**	**0.063928**	**7.789352**	**7.853280**	**0.991860**
55	721041	3609	828716	892325	1940
60	799843	3292	868276	931567	2020
65	879040	2976	908032	971008	2099
70	958634	2662	947986	8.010648	2178
75	16.038627	2349	988139	050488	2255
80	119021	2039	8.028491	090530	2332
85	199818	1729	069044	130773	2408
90	281020	1421	109799	171221	2483
95	362629	1115	150757	211872	2558
2.800	**16.444647**	**0.060810**	**8.191918**	**8.252728**	**0.992632**
05	527076	0507	233285	293791	2705
10	609918	0205	274857	335062	2777
15	693176	59905	316636	376540	2849
20	776851	9606	358622	418228	2919
25	860945	9309	400818	460127	2990
30	945461	9013	443224	502237	3059
35	17.030400	8719	485841	544559	3128
40	115766	8426	528670	587096	3196
45	201559	8134	571712	629846	3264
2.850	**17.287782**	**0.057844**	**8.614969**	**8.672813**	**0.993330**
55	374437	7556	658441	715997	3397
60	461527	7269	702129	759398	3462
65	549053	6983	746035	803018	3527
70	637018	6699	790160	846859	3591
75	725424	6416	834504	890920	3655
80	814273	6135	879069	935204	3718
85	903568	5855	923856	979711	3780
90	993310	5576	968867	9.024443	3842
95	18.083501	5299	9.014101	069400	3903
2.900	**18.174145**	**0.055023**	**9.059561**	**9.114584**	**0.993963**
05	265244	4749	105247	159996	4023
10	356799	4476	151161	205637	4082
15	448812	4204	197304	251508	4141
20	541287	3934	243677	297611	4199
25	634226	3665	290281	343945	4257
30	727630	3397	337117	390514	4314
35	821503	3131	384186	437317	4370
40	915846	2866	431490	484356	4426
45	19.010662	2602	479030	531632	4481
2.950	**19.105954**	**0.052340**	**9.526807**	**9.579147**	**0.994536**
55	201723	2079	574822	626901	4590
60	297972	1819	623076	674895	4644
65	394703	1560	671571	723132	4697
70	491920	1303	720308	771611	4750
75	589623	1047	769288	820335	4802
80	687817	0793	818512	869305	4853
85	786502	0540	867981	918521	4905
90	885682	0287	917698	967985	4955
95	985360	0037	967662	10.017698	5005

x	e^x	e^{-x}	sinh x	cosh x	tanh x
3.00	**20.085537**	**0.049787**	**10.017875**	**10.067662**	**0.995055**
1	287940	9292	119054	168346	5152
2	491292	8801	221245	270046	5248
3	697233	8316	324458	372774	5342
4	905243	7835	428704	476539	5434
5	21.115344	7359	533993	581352	5524
6	327557	6888	640335	687222	5613
7	541903	6421	747741	794162	5699
8	758402	5959	856222	902181	5784
9	977078	5502	965788	11.011290	5868
3.10	**22.197951**	**0.045049**	**11.076451**	**11.121500**	**0.995949**
1	421044	4601	188222	232823	6029
2	646380	4157	301111	345268	6108
3	873980	3718	415131	458849	6185
4	23.103867	3283	530292	573575	6260
5	336065	2852	646606	689458	6334
6	570596	2426	764085	806511	6407
7	807484	2004	882740	924744	6478
8	24.046754	1586	12.002584	12.044170	6547
9	288427	1172	123628	164800	6615
3.20	**24532530**	**0.040762**	**12.245884**	**12.286646**	**0.996682**
1	779086	0357	369365	409721	6748
2	25.028120	39955	494083	534038	6812
3	279657	9557	620050	659607	6875
4	533722	9164	747279	786443	6937
5	790340	8774	875783	914557	6998
6	26.049537	8388	13.005574	13.043963	7057
7	31.339	8006	136666	174673	7115
8	575773	7628	269072	306700	7172
9	842864	7254	402805	440059	7228
3.30	**27.112639**	**0.036883**	**13.537878**	**13.574761**	**0.997283**
1	385125	6516	674305	710821	7337
2	660351	6153	812099	848252	7389
3	938342	5793	951274	987067	7441
4	28.219127	5437	14.091845	14.127282	7492
5	502734	5084	233825	268909	7541
6	789191	4735	377228	411963	7590
7	29.078527	4390	522069	556458	7637
8	370771	4047	668362	702409	7684
9	665952	3709	816122	849830	7730
3.40	**29.964100**	**0.033373**	**14.965363**	**14.998737**	**0.997775**
1	30.265244	3041	15.116102	15.149143	7819
2	569415	2712	268351	301064	7862
3	876643	2387	422128	454515	7904
4	31.186958	2065	577447	609511	7948
5	500392	1746	734323	766069	7986
6	816977	1430	892773	924203	8026
7	32.136742	1117	16.052813	16.083930	8065
8	459722	0807	214457	245265	8104
9	785948	0501	377723	408224	8141

x	e^x	e^{-x}	sinh x	cosh x	tanh x
3.50	**33.115452**	**0.030197**	**16.542627**	**16.572825**	**0.998178**
1	448268	29897	709185	739082	8214
2	784428	9599	877415	907014	8249
3	34.123968	9305	17.047331	17.076636	8284
4	466919	9013	218953	247966	8318
5	813317	8725	392296	421021	8351
6	35.163197	8439	567379	595818	8384
7	516593	8156	744219	772375	8416
8	35.873541	7876	922833	950708	8447
9	36.234076	7598	18.103239	18.130837	8478
3.60	**36.598234**	**0.027324**	**18.285455**	**18.312779**	**0.998508**
1	966053	7052	469500	496552	8537
2	37.337568	6783	655393	682175	8566
3	712817	6516	843150	869666	8595
4	38.091837	6252	19.032792	19.059045	8623
5	474666	5991	224337	250329	8650
6	861343	5733	417805	443538	8677
7	39.251906	5476	613215	638691	8703
8	646394	5223	810586	835809	8728
9	40.044847	4972	20.009937	20.034909	8754
3.70	**40.447304**	**0.024724**	**20.211290**	**20.236014**	**0.998778**
1	853807	4478	414665	439142	8802
2	41.264394	4234	620080	644314	8826
3	679108	3993	827558	851550	8849
4	42.097990	3754	21.037118	21.060872	8872
5	521082	3518	248782	272300	8894
6	948426	3284	462571	485855	8916
7	43.380065	3052	678506	701558	8938
8	816042	2823	896610	919432	8959
9	44.256400	2596	22.116902	22.139498	8979
3.80	**44.701184**	**0.022371**	**22.339407**	**22.361778**	**0.999000**
1	45.150439	2148	564145	586294	9019
2	604208	1928	791140	813068	9039
3	46.062538	1710	23.020414	23.042124	9058
4	525474	1494	251990	273484	9076
5	993063	1280	485892	507171	9095
6	47.465351	1068	722142	743210	9113
7	942386	0858	960764	981622	9130
8	48.424215	0651	24.201782	24.222433	9147
9	910887	0445	445221	465666	9164
3.90	**49.402449**	**0.020242**	**24.691104**	**24.711346**	**0.999181**
1	898952	0041	939456	959496	9197
2	50.400445	19841	25.190302	25.210143	9213
3	906978	9644	443667	463311	9229
4	51.418601	9448	699577	719025	9244
5	935367	9255	958056	977311	9259
6	52.457326	9063	26.219131	26.238195	9273
7	984531	8873	482829	501702	9288
8	53.517034	8686	749174	767860	9302
9	54.054889	8500	27.018195	27.036695	9316

x	e^x	e^{-x}	sinh x	cosh x	tanh x
4.00	**54.598150**	**0.018316**	**27.289917**	**27.308233**	**0.999329**
05	57.397457	7422	28.690017	28.707440	393
10	60.340288	6573	30.161857	30.178430	451
15	63.434000	5764	31.709118	31.724882	503
20	66.686331	4996	33.335668	33.350663	550
25	70.105412	4264	35.045574	35.059838	593
30	73.699794	3569	36.843113	36.856681	632
35	77.478463	2907	38.732778	38.745685	667
40	81.450869	2277	40.719296	40.731573	699
45	85.626944	1679	42.807633	42.819311	727
4.50	**90.017131**	**0.011109**	**45.003011**	**45.014120**	**0.999753**
55	94.632408	0567	47.310921	47.321488	777
60	99.484316	0052	49.737132	49.747184	798
65	104.584986	09562	52.287712	52.297279	817
70	109.947172	9095	54.969039	54.978134	835
75	115.584285	8652	57.787816	57.796468	850
80	121.510418	8230	60.751094	60.759324	865
85	127.740390	7828	63.866281	63.874109	877
90	134.289780	7447	67.141167	67.148613	889
95	141.174964	7083	70.583940	70.591024	900
5.00	**148.413159**	**0.006738**	**74.203211**	**74.209949**	**0.999909**
10	164.021907	6097	82.007905	82.014002	26
20	181.272242	5517	90.633363	90.638879	39
30	200.336810	4992	100.165909	100.170901	50
40	221.406416	4517	110.700950	110.705466	59
50	244.691932	4087	122.343922	122.348010	67
60	270.426407	3698	135.211355	135.215053	73
70	298.867401	3346	149.432028	149.435373	78
80	330.299560	3028	165.148266	165.151294	82
90	365.037468	2739	182.517364	182.520104	85
6.00	**403.428793**	**0.002479**	**201.713157**	**201.715636**	**88**
$.1\pi$	1.369108	.730403	.319353	1.049755	.304216
$.2\pi$	1.874456	.533488	.670484	1.203972	.556893
$.3\pi$	2.566332	.389661	1.088336	1.477997	.736359
$.4\pi$	3.513586	.284610	1.614488	1.899098	.850134
$.5\pi$	4.810477	.207880	2.301299	2.509178	.917152
$.6\pi$	6.586062	.151836	3.217113	3.368949	.954931
$.7\pi$	9.017029	.110901	4.453064	4.563965	.975701
$.8\pi$	12.345284	.081003	6.132141	6.213143	.986963
$.9\pi$	16.902024	.059165	8.421430	8.480594	.993024
π	23.140693	.043214	11.548739	11.591953	.996272

Gamma Function

$$\Gamma(x) = \int_0^\infty z^{x-1} \cdot e^{-z} dz = \int_0^1 \left[\log \frac{1}{z}\right]^{x-1} dz$$

If x is a positive integer, $\Gamma(x + 1) = x!$
The table below gives $\Gamma(x + 1)$ for $0 \leq x < 1$. For other values, note that $\Gamma(x + 1) = x\Gamma(x)$.

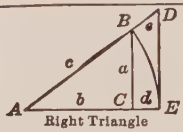
x	0	1	2	3	4	5	6	7	8	9
0.0	1.0000	0.9943	9888	9835	9784	9735	9687	9642	9597	9555
.1	0.9514	.9474	9436	9399	9364	9330	9298	9267	9237	9209
.2	.9182	.9156	9131	9108	9085	9064	9044	9025	9007	8990
.3	.8975	.8960	8946	8934	8922	8912	8902	8893	8885	8879
.4	.8873	.8868	8864	8860	8858	8857	8856	8856	8857	8859
.5	.8862	.8866	8870	8876	8882	8889	8896	8905	8914	8924
.6	.8935	.8947	8959	8972	8986	9001	9017	9033	9050	9068
.7	.9086	.9106	9126	9147	9168	9191	9214	9238	9262	9288
.8	.9314	.9341	9368	9397	9426	9456	9487	9518	9551	9584
.9	.9618	.9652	9688	9724	9761	9799	9837	9877	9917	9958

Probability Integral

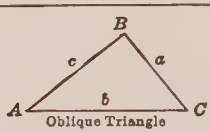
$$\frac{2}{\sqrt{\pi}} \int_0^x e^{-t^2} dt$$

0.0	.00000	1128	2256	3384	4511	5637	6762	7886	9008	0128
.1	.11246	2362	3476	4587	5695	6800	7901	8999	0094	1184
.2	.22270	3352	4430	5502	6570	7633	8690	9742	0788	1828
.3	.32863	3891	4913	5928	6936	7938	8933	9921	0901	1874
.4	.42839	3797	4747	5689	6623	7548	8466	9375	0275	1167
.5	.52050	2924	3790	4646	5494	6332	7162	7982	8792	9594
.6	.60386	1168	1941	2705	3459	4203	4938	5663	6378	7084
.7	.67780	8467	9143	9810	0468	1116	1754	2382	3001	3610
.8	.74210	4800	5381	5952	6514	7067	7610	8144	8669	9184
.9	.79691	0188	0677	1156	1627	2089	2542	2987	3423	3851
1.0	.84270	4681	5084	5478	5865	6244	6614	6977	7333	7680
.1	.88020	8353	8679	8997	9308	9612	9910	0200	0484	0761
.2	.91031	1296	1553	1805	2051	2290	2524	2751	2973	3190
.3	.93401	3606	3807	4002	4191	4376	4556	4731	4902	5067
.4	.95229	5385	5538	5686	5830	5969	6105	6237	6365	6490
.5	.96611	6728	6841	6952	7059	7162	7263	7360	7455	7546
.6	.97635	7721	7804	7884	7962	8038	8110	8181	8249	8315
.7	.98379	8441	8500	8558	8613	8667	8719	8769	8817	8864
.8	.98909	8952	8994	9035	9074	9111	9147	9182	9216	9248
.9	.99279	9309	9338	9366	9392	9418	9443	9466	9489	9511
2.0	.99532	9552	9572	9591	9609	9626	9642	9658	9673	9688
.1	.99702	9715	9728	9741	9753	9764	9775	9785	9795	9805
.2	.99814	9822	9831	9839	9846	9854	9861	9867	9874	9880
.3	.99886	9891	9897	9902	9906	9911	9915	9920	9924	9928
.4	.99931	9935	9938	9941	9944	9947	9950	9952	9955	9957
.5	.99959	9961	9963	9965	9967	9969	9971	9972	9974	9975
.6	.99976	9978	9979	9980	9981	9982	9983	9984	9985	9986
.7	.99987	9987	9988	9989	9989	9990	9991	9991	9992	9992
.8	.99992	9993	9993	9994	9994	9994	9995	9995	9995	9996
.9	.99996	9996	9996	9997	9997	9997	9997	9997	9997	9998

TABLE XII.—TRIGONOMETRIC FORMULAS



Right Triangle



Oblique Triangle

PLANE RIGHT TRIANGLES

$$\sin A = \frac{a}{c} = \cos B \qquad \sec A = \frac{c}{b} = \operatorname{cosec} B$$

$$\cos A = \frac{b}{c} = \sin B \qquad \operatorname{cosec} A = \frac{c}{a} = \sec B$$

$$\tan A = \frac{a}{b} = \cot B \qquad \operatorname{vers} A = \frac{c-b}{c} = \frac{d}{c}$$

$$\cot A = \frac{b}{a} = \tan B \qquad \operatorname{exsec} A = \frac{e}{c}$$

$$a = c \sin A = c \cos B = b \tan A = b \cot B = \sqrt{c^2 - b^2}$$

$$b = c \cos A = c \sin B = a \cot A = a \tan B = \sqrt{c^2 - a^2}$$

$$c = \frac{a}{\sin A} = \frac{a}{\cos B} = \frac{b}{\sin B} = \frac{b}{\cos A} = \frac{d}{\operatorname{vers} A} = \frac{e}{\operatorname{exsec} A} = \sqrt{a^2 + b^2}$$

$$d = c \operatorname{vers} A \qquad e = c \operatorname{exsec} A$$

PLANE OBLIQUE TRIANGLES

Given	Sought	Formulas
A, a	*radius circumscribed circle*	$R = \dfrac{a}{2 \sin A}$
a, b, c	*radius inscribed circle*	If $s = \frac{1}{2}(a + b + c)$, $r = \sqrt{\dfrac{(s-a)(s-b)(s-c)}{s}}$
A, B, a	b, c	$b = \dfrac{a}{\sin A} \cdot \sin B$ $\qquad$ $c = \dfrac{a}{\sin A} \cdot \sin (A + B)$
A, a, b	B, c	$\sin B = \dfrac{\sin A}{a} \cdot b$ $\qquad$ $c = \dfrac{a}{\sin A} \cdot \sin C$
C, a, b,	c	$c^2 = a^2 + b^2 - 2ab \cos C$
C, a, b	$\frac{1}{2}(A + B)$	$\frac{1}{2}(A + B) = 90° - \frac{1}{2}C$
	$\frac{1}{2}(A - B)$	$\tan \frac{1}{2}(A - B) = \dfrac{a-b}{a+b} \cdot \tan \frac{1}{2}(A + B)$
a, b, c	A	$\sin \frac{1}{2}A = \sqrt{\dfrac{(s-b)(s-c)}{bc}}$
		$\cos \frac{1}{2}A = \sqrt{\dfrac{s(s-a)}{bc}}$, $\tan \frac{1}{2}A = \sqrt{\dfrac{(s-b)(s-c)}{s(s-a)}} = \dfrac{r}{s-a}$
		$\sin A = \dfrac{2}{bc}\sqrt{s(s-a)(s-b)(s-c)}$
		$\operatorname{vers} A = \dfrac{2(s-b)(s-c)}{bc}$
	area	*area* $= \sqrt{s(s-a)(s-b)(s-c)} = rs$
C, a, b	*area*	*area* $= \frac{1}{2}ab \sin C$
A, B, C, a	*area*	*area* $= \dfrac{a^2 \sin B \cdot \sin C}{2 \sin A}$

Spherical Right Triangles

$$\cos c = \cos a \cos b \qquad \sin A = \frac{\sin a}{\sin c}$$

$$\cos c = \cot A \cot B$$

$$\cos A = \sin B \cos a \qquad \cos A = \frac{\tan b}{\tan c}$$

$$\tan A = \frac{\tan a}{\sin b}$$

Spherical Oblique Triangles

$$\cos a = \cos b \cos c + \sin b \sin c \cos A$$

$$\cos A = -\cos B \cos C + \sin B \sin C \cos a$$

$$\frac{\sin a}{\sin A} = \frac{\sin b}{\sin B} = \frac{\sin c}{\sin C}$$

$$\sin a \cos B = \cos b \sin c - \sin b \cos c \cos A$$

$$\sin A \cos b = \cos B \sin C + \sin B \cos C \cos a$$

$$\tan \frac{b+c}{2} = \tan \frac{a}{2} \cos \frac{B-C}{2} \sec \frac{B+C}{2}$$

$$\tan \frac{b-c}{2} = \tan \frac{a}{2} \sin \frac{B-C}{2} \csc \frac{B+C}{2}$$

$$\tan \frac{B+C}{2} = \cot \frac{A}{2} \cos \frac{b-c}{2} \sec \frac{b+c}{2}$$

$$\tan \frac{B-C}{2} = \cot \frac{A}{2} \sin \frac{b-c}{2} \csc \frac{b+c}{2}$$

If $a + b + c = 2s$, and $k = \sqrt{\dfrac{\sin (s-a) \sin (s-b) \sin (s-c)}{\sin s}}$, then

$$\tan \frac{A}{2} = \frac{k}{\sin (s-a)} \text{ and } \tan r = k$$

where r is the radius of the inscribed circle.

The radius of the circumscribed circle is

$$R = 2 \cos \frac{a}{2} \cos \frac{b}{2} \cos \frac{c}{2} \frac{\sin A}{\sin a}$$

The area equals the square of the radius of the sphere times $[(A + B + C) - \pi]$.

TABLE XIII.—INTEGRALS

N. B. In these formulas x and X represent variables, and all other letters represent constants. All angles are assumed to be in radians; and the base of logarithms is e unless otherwise indicated. An arbitrary constant may be added to the right-hand side of each formula.

Rational Algebraic Integrals

1. $\int dx = x$

2. $\int af(x)dx = a\int f(x)dx$

3. $\int [f(x) + \phi(x) - \psi(x)]\,dx = \int f(x)dx + \int \phi(x)dx - \int \psi(x)dx$

4. $\int x^m dx = \frac{x^{m+1}}{m+1}$ when $m \neq -1$

5. $\int \frac{dx}{x} = \log x$

6. $\int (ax+b)^m dx = \frac{(ax+b)^{m+1}}{a(m+1)}$ when $m \neq -1$

7. $\int \frac{dx}{ax+b} = \frac{1}{a}\log(ax+b)$

8. $\int \frac{xdx}{ax+b} = \frac{1}{a^2}\{ax + b - b\log(ax+b)\}$

9. $\int \frac{xdx}{(ax+b)^2} = \frac{1}{a^2}\left\{\frac{b}{ax+b} + \log(ax+b)\right\}$

10. $\int \frac{x^2dx}{ax+b} = \frac{1}{a^3}\left\{\frac{(ax+b)^2}{2} - 2b(ax+b) + b^2\log(ax+b)\right\}$

11. $\int \frac{x^2dx}{(ax+b)^2} = \frac{1}{a^3}\left\{ax + b - \frac{b^2}{ax+b} - 2b\log(ax+b)\right\}$

12. $\int \frac{dx}{x(ax+b)} = \frac{1}{b}\log\frac{x}{ax+b}$

From Peirce and Carver's "Formulas and Tables," pages 33 to 46a.

13. $$\int \frac{dx}{x(ax+b)^2} = \frac{1}{b(ax+b)} + \frac{1}{b^2}\log\frac{x}{ax+b}$$

14. $$\int \frac{dx}{x^2(ax+b)} = -\frac{1}{bx} + \frac{a}{b^2}\log\frac{ax+b}{x}$$

15. $$\int \frac{dx}{x^2(ax+b)^2} = -\frac{2ax+b}{b^2x(ax+b)} + \frac{2a}{b^3}\log\frac{ax+b}{x}$$

16. $$\int \frac{dx}{x^2+a^2} = \frac{1}{a}\tan^{-1}\frac{x}{a}$$

17. $$\int \frac{dx}{x^2-a^2} = \frac{1}{2a}\log\frac{x-a}{x+a} = -\frac{1}{a}\tanh^{-1}\frac{a}{x}$$

$$\text{or } \frac{1}{2a}\log\frac{a-x}{a+x} = -\frac{1}{a}\tanh^{-1}\frac{x}{a}$$

(For definition of the symbol $\tanh^{-1}$, see page xxii.)

$\int \frac{dx}{ax^2+b}$ reduces to 16 or 17 by taking the factor $\frac{1}{a}$ outside the integral sign.

18. $$\int \frac{dx}{(ax^2+b)^m} = \frac{x}{2(m-1)b(ax^2+b)^{m-1}} + \frac{2m-3}{2(m-1)b}\int \frac{dx}{(ax^2+b)^{m-1}} \quad \text{when } m \neq 1$$

19. $$\int \frac{xdx}{(ax^2+b)^m} = -\frac{1}{2(m-1)a(ax^2+b)^{m-1}} \quad \text{when } m \neq 1$$

20. $$\int \frac{xdx}{ax^2+b} = \frac{1}{2a}\log(ax^2+b)$$

21. $$\int \frac{x^2dx}{ax^2+b} = \frac{x}{a} - \frac{b}{a}\int \frac{dx}{ax^2+b}$$

22. $$\int \frac{x^2dx}{(ax^2+b)^m} = -\frac{x}{2(m-1)a(ax^2+b)^{m-1}} + \frac{1}{2(m-1)a}\int \frac{dx}{(ax^2+b)^{m-1}} \quad \text{when } m \neq 1$$

23. $$\int \frac{dx}{ax^3+b} = \frac{k}{3b}\left\{ \sqrt{3}\tan^{-1}\frac{2x-k}{k\sqrt{3}} + \log\frac{k+x}{\sqrt{k^2-kx+x^2}} \right\}$$

24. $$\int \frac{x\,dx}{ax^3+b} = \frac{1}{3ak}\left\{ \sqrt{3}\tan^{-1}\frac{2x-k}{k\sqrt{3}} - \log\frac{k+x}{\sqrt{k^2-kx+x^2}} \right\}$$

where $k = \sqrt[3]{\frac{b}{a}}$

25. $$\int \frac{dx}{x(ax^n+b)} = \frac{1}{bn}\log\frac{x^n}{ax^n+b}$$

Let $X = ax^2+bx+c$ and $q = b^2-4ac$.

26. $$\int \frac{dx}{X} = \frac{1}{\sqrt{q}}\log\frac{2ax+b-\sqrt{q}}{2ax+b+\sqrt{q}} \quad \text{when } q > 0$$

27. $$\int \frac{dx}{X} = \frac{2}{\sqrt{-q}}\tan^{-1}\frac{2ax+b}{\sqrt{-q}} \quad \text{when } q < 0$$

For the case $q = 0$, use formula 6 with $m = -2$.

28. $$\int \frac{dx}{X^n} = -\frac{2ax+b}{(n-1)qX^{n-1}} - \frac{2(2n-3)a}{q(n-1)}\int \frac{dx}{X^{n-1}} \quad \text{when } n \neq 1$$

29. $$\int \frac{x\,dx}{X} = \frac{1}{2a}\log X - \frac{b}{2a}\int \frac{dx}{X}$$

30. $$\int \frac{(mx+n)dx}{X} = \frac{m}{2a}\log X + \frac{2an-bm}{2a}\int \frac{dx}{X}$$

31. $$\int \frac{x^2dx}{X} = \frac{x}{a} - \frac{b}{2a^2}\log X + \frac{b^2-2ac}{2a^2}\int \frac{dx}{X}$$

For the method of partial fractions, see p. 179; this aids in integrating more general rational fractions.

Integrals Involving $\sqrt{ax+b}$

$$\int \sqrt{ax+b}\,dx$$

$$\int \frac{dx}{\sqrt{ax+b}}$$

$$\int (ax+b)^n\sqrt{ax+b}\,dx$$

$$\int \frac{dx}{(ax+b)^n\sqrt{ax+b}}$$

These may all be integrated by formula 6.

32. $$\int x\sqrt{ax+b}\,dx = \frac{2(3ax-2b)\sqrt{(ax+b)^3}}{15a^2}$$

33. $$\int x^2\sqrt{ax+b}\,dx = \frac{2(15a^2x^2-12abx+8b^2)\sqrt{(ax+b)^3}}{105a^3}$$

34. $$\int x^m\sqrt{ax+b}\,dx = \frac{2}{a(2m+3)}\left\{x^m\sqrt{(ax+b)^3} - mb\int x^{m-1}\sqrt{ax+b}\,dx\right\}$$

35. $$\int \frac{\sqrt{ax+b}\,dx}{x} = 2\sqrt{ax+b} + \sqrt{b}\log\frac{\sqrt{ax+b}-\sqrt{b}}{\sqrt{ax+b}+\sqrt{b}} \quad \text{when } b>0$$

36. $$\int \frac{\sqrt{ax+b}\,dx}{x} = 2\sqrt{ax+b} - 2\sqrt{-b}\tan^{-1}\sqrt{\frac{ax+b}{-b}} \quad \text{when } b<0$$

For the case $b=0$, use formula 4.

37. $$\int \frac{\sqrt{ax+b}\,dx}{x^m} = -\frac{1}{(m-1)b}\left\{\frac{\sqrt{(ax+b)^3}}{x^{m-1}} + \frac{(2m-5)a}{2}\int \frac{\sqrt{ax+b}\,dx}{x^{m-1}}\right\} \quad \text{when } m\neq 1$$

38. $$\int \frac{x\,dx}{\sqrt{ax+b}} = \frac{2(ax-2b)}{3a^2}\sqrt{ax+b}$$

39. $$\int \frac{x^2\,dx}{\sqrt{ax+b}} = \frac{2(3a^2x^2-4abx+8b^2)}{15a^3}\sqrt{ax+b}$$

40. $$\int \frac{x^m\,dx}{\sqrt{ax+b}} = \frac{2}{a(2m+1)}\left\{x^m\sqrt{ax+b} - mb\int \frac{x^{m-1}\,dx}{\sqrt{ax+b}}\right\} \quad \text{when } m\neq -\tfrac{1}{2}$$

41. $$\int \frac{dx}{x\sqrt{ax+b}} = \frac{1}{\sqrt{b}}\log\frac{\sqrt{ax+b}-\sqrt{b}}{\sqrt{ax+b}+\sqrt{b}} \quad \text{when } b>0$$

42. $$\int \frac{dx}{x\sqrt{ax+b}} = \frac{2}{\sqrt{-b}}\tan^{-1}\sqrt{\frac{ax+b}{-b}} \quad \text{when } b<0$$

For the case $b=0$, use formula 4.

43. $$\int \frac{dx}{x^m\sqrt{ax+b}} = -\frac{\sqrt{ax+b}}{(m-1)bx^{m-1}} - \frac{(2m-3)a}{(2m-2)b}\int \frac{dx}{x^{m-1}\sqrt{ax+b}} \quad \text{when } m\neq 1$$

Integrals Involving $\sqrt{x^2 \pm a^2}$ and $\sqrt{a^2 - x^2}$

(These are special cases of the more general integrals given in the next section.)

44. $\displaystyle\int \sqrt{x^2 \pm a^2}\, dx = \tfrac{1}{2}\left[x\sqrt{x^2 \pm a^2} \pm a^2 \log\left(x + \sqrt{x^2 \pm a^2}\right)\right]$*

45. $\displaystyle\int \sqrt{a^2 - x^2}\, dx = \tfrac{1}{2}\left(x\sqrt{a^2 - x^2} + a^2 \sin^{-1}\frac{x}{a}\right)$

46. $\displaystyle\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \log\left(x + \sqrt{x^2 \pm a^2}\right)$*

47. $\displaystyle\int \frac{dx}{\sqrt{a^2 - x^2}} = \sin^{-1}\frac{x}{a}$ 48. $\displaystyle\int x\sqrt{x^2 \pm a^2}\, dx = \tfrac{1}{3}\sqrt{(x^2 \pm a^2)^3}$

49. $\displaystyle\int x\sqrt{a^2 - x^2}\, dx = -\tfrac{1}{3}\sqrt{(a^2 - x^2)^3}$

50. $\displaystyle\int x^2\sqrt{x^2 \pm a^2}\, dx = \frac{x}{4}\sqrt{(x^2 \pm a^2)^3}$

$$\mp \frac{a^2}{8}\left(x\sqrt{x^2 \pm a^2} \pm a^2 \log\left(x + \sqrt{x^2 \pm a^2}\right)\right)$$*

51. $\displaystyle\int x^2\sqrt{a^2 - x^2}\, dx = -\frac{x}{4}\sqrt{(a^2 - x^2)^3}$

$$+ \frac{a^2}{8}\left(x\sqrt{a^2 - x^2} + a^2 \sin^{-1}\frac{x}{a}\right)$$

52. $\displaystyle\int \frac{\sqrt{a^2 \pm x^2}}{x}\, dx = \sqrt{a^2 \pm x^2} - a \log\frac{a + \sqrt{a^2 \pm x^2}}{x}$*

53. $\displaystyle\int \frac{\sqrt{x^2 - a^2}}{x}\, dx = \sqrt{x^2 - a^2} - a \cos^{-1}\frac{a}{x}$

* In these formulas we may replace

$\log\left(x + \sqrt{x^2 + a^2}\right)$	by $\sinh^{-1}\frac{x}{a}$
$\log\left(x + \sqrt{x^2 - a^2}\right)$	by $\cosh^{-1}\frac{x}{a}$
$\log\frac{a + \sqrt{a^2 + x^2}}{x}$	by $\sinh^{-1}\frac{a}{x}$
$\log\frac{a + \sqrt{a^2 - x^2}}{x}$	by $\cosh^{-1}\frac{a}{x}$

See page xxii

54. $\int \frac{\sqrt{x^2 \pm a^2}\,dx}{x^2} = -\frac{\sqrt{x^2 \pm a^2}}{x} + \log\left(x + \sqrt{x^2 \pm a^2}\right)$ *

55. $\int \frac{\sqrt{a^2 - x^2}}{x^2}\,dx = -\frac{\sqrt{a^2 - x^2}}{x} - \sin^{-1}\frac{x}{a}$

56. $\int \frac{x\,dx}{\sqrt{a^2 - x^2}} = -\sqrt{a^2 - x^2}$

57. $\int \frac{x\,dx}{\sqrt{x^2 \pm a^2}} = \sqrt{x^2 \pm a^2}$

58. $\int \frac{x^2\,dx}{\sqrt{x^2 \pm a^2}} = \frac{x}{2}\sqrt{x^2 \pm a^2} \mp \frac{a^2}{2}\log\left(x + \sqrt{x^2 \pm a^2}\right)$ *

59. $\int \frac{x^2\,dx}{\sqrt{a^2 - x^2}} = -\frac{x}{2}\sqrt{a^2 - x^2} + \frac{a^2}{2}\sin^{-1}\frac{x}{a}$

60. $\int \frac{dx}{x\sqrt{x^2 - a^2}} = \frac{1}{a}\cos^{-1}\frac{a}{x}$

61. $\int \frac{dx}{x\sqrt{a^2 \pm x^2}} = -\frac{1}{a}\log\left(\frac{a + \sqrt{a^2 \pm x^2}}{x}\right)$ *

62. $\int \frac{dx}{x^2\sqrt{x^2 \pm a^2}} = \mp\frac{\sqrt{x^2 \pm a^2}}{a^2 x}$

63. $\int \frac{dx}{x^2\sqrt{a^2 - x^2}} = -\frac{\sqrt{a^2 - x^2}}{a^2 x}$

64. $\int \sqrt{(x^2 \pm a^2)^3}\,dx = \frac{1}{4}\left[x\sqrt{(x^2 \pm a^2)^3} \pm \frac{3a^2 x}{2}\sqrt{x^2 \pm a^2} + \frac{3a^4}{2}\log\left(x + \sqrt{x^2 \pm a^2}\right)\right]$ *

65. $\int \sqrt{(a^2 - x^2)^3}\,dx = \frac{1}{4}\left[x\sqrt{(a^2 - x^2)^3} + \frac{3a^2 x}{2}\sqrt{a^2 - x^2} + \frac{3a^4}{2}\sin^{-1}\frac{x}{a}\right]$

66. $\int \frac{dx}{\sqrt{(x^2 \pm a^2)^3}} = \frac{\pm x}{a^2\sqrt{x^2 \pm a^2}}$

67. $\int \frac{dx}{\sqrt{(a^2 - x^2)^3}} = \frac{x}{a^2\sqrt{a^2 - x^2}}$

* See note on previous page.

Integrals Involving $\sqrt{ax^2+bx+c}$

Let $X = ax^2 + bx + c$ and $q = b^2 - 4ac$

68. $$\int \frac{dx}{\sqrt{X}} = \frac{1}{\sqrt{a}} \log\left(\sqrt{X} + \frac{2ax+b}{2\sqrt{a}}\right) \text{ when } a > 0$$

69. $$\int \frac{dx}{\sqrt{X}} = \frac{1}{\sqrt{-a}} \sin^{-1}\left(\frac{-2ax-b}{\sqrt{q}}\right) \text{ when } a < 0$$

70. $$\int \frac{x\,dx}{\sqrt{X}} = \frac{\sqrt{X}}{a} - \frac{b}{2a}\int \frac{dx}{\sqrt{X}}$$

71. $$\int \frac{(mx+n)dx}{\sqrt{X}} = \frac{m\sqrt{X}}{a} + \frac{2an-bm}{2a}\int \frac{dx}{\sqrt{X}}$$

72. $$\int \frac{x^2dx}{\sqrt{X}} = \frac{(2ax-3b)\sqrt{X}}{4a^2} + \frac{3b^2-4ac}{8a^2}\int \frac{dx}{\sqrt{X}}$$

73. $$\int \frac{dx}{x\sqrt{X}} = -\frac{1}{\sqrt{c}} \log\left(\frac{\sqrt{X}+\sqrt{c}}{x} + \frac{b}{2\sqrt{c}}\right) \text{ when } c > 0$$

74. $$\int \frac{dx}{x\sqrt{X}} = \frac{1}{\sqrt{-c}} \sin^{-1}\frac{bx+2c}{x\sqrt{q}} \quad \text{when } c < 0$$

75. $$\int \frac{dx}{x\sqrt{X}} = -\frac{2\sqrt{X}}{bx} \quad \text{when } c = 0$$

76. $$\int \frac{dx}{(mx+n)\sqrt{X}} = -\frac{1}{\sqrt{k}} \log\left(\frac{m\sqrt{X}+\sqrt{k}}{mx+n} + \frac{bm-2an}{2\sqrt{k}}\right) \text{ when } k > 0$$

77. $$\int \frac{dx}{(mx+n)\sqrt{X}} = \frac{1}{\sqrt{-k}} \sin^{-1}\left\{\frac{(bm-2an)(mx+n)+2k}{m(mx+n)\sqrt{q}}\right\} \text{ when } k < 0$$

78. $$\int \frac{dx}{(mx+n)\sqrt{X}} = -\frac{2m\sqrt{X}}{(bm-2an)(mx+n)} \text{ when } k = 0$$

where $k = an^2 - bmn + cm^2$

79. $\displaystyle\int \frac{dx}{x^2\sqrt{X}} = -\frac{\sqrt{X}}{cx} - \frac{b}{2c}\int \frac{dx}{x\sqrt{X}}$

80. $\displaystyle\int \sqrt{X}dx = \frac{(2ax+b)\sqrt{X}}{4a} - \frac{q}{8a}\int \frac{dx}{\sqrt{X}}$

81. $\displaystyle\int x\sqrt{X}\,dx = \frac{X\sqrt{X}}{3a} - \frac{b(2ax+b)\sqrt{X}}{8a^2} + \frac{bq}{16a^2}\int \frac{dx}{\sqrt{X}}$

82. $\displaystyle\int x^2\sqrt{X}dx = \frac{(6ax-5b)X\sqrt{X}}{24a^2} + \frac{(5b^2-4ac)(2ax+b)\sqrt{X}}{64a^3} - \frac{(5b^2-4ac)q}{128a^3}\int \frac{dx}{\sqrt{X}}$

83. $\displaystyle\int \frac{\sqrt{X}dx}{x} = \sqrt{X} + \frac{b}{2}\int \frac{dx}{\sqrt{X}} + c\int \frac{dx}{x\sqrt{X}}$

84. $\displaystyle\int \frac{\sqrt{X}dx}{mx+n} = \frac{\sqrt{X}}{m} + \frac{bm-2an}{2m^2}\int \frac{dx}{\sqrt{X}} + \frac{an^2-bmn+cm^2}{m^2}\int \frac{dx}{(mx+n)\sqrt{X}}$

85. $\displaystyle\int \frac{\sqrt{X}dx}{x^2} = -\frac{\sqrt{X}}{x} + \frac{b}{2}\int \frac{dx}{x\sqrt{X}} + a\int \frac{dx}{\sqrt{X}}$

86. $\displaystyle\int \frac{dx}{X\sqrt{X}} = -\frac{2(2ax+b)}{q\sqrt{X}}$

87. $\displaystyle\int X\sqrt{X}\,dx = \frac{(2ax+b)X\sqrt{X}}{8a} - \frac{3q(2ax+b)\sqrt{X}}{64a^2} + \frac{3q^2}{128a^2}\int \frac{dx}{\sqrt{X}}$

Miscellaneous Irrational Integrals

88. $\displaystyle\int \sqrt{2ax-x^2}dx = \frac{x-a}{2}\sqrt{2ax-x^2} + \frac{a^2}{2}\sin^{-1}\frac{x-a}{a}$

89. $\displaystyle\int \frac{dx}{\sqrt{2ax-x^2}} = \cos^{-1}\frac{a-x}{a}$

90. $\int \sqrt{\frac{mx+n}{ax+b}}\,dx = \int \frac{(mx+n)dx}{\sqrt{amx^2+(bm+an)x+bn}}$, then use formula 71.

Logarithmic Integrals

91. $\int \log_a x\,dx = x\log_a \frac{x}{e}$

92. $\int \log x\,dx = x(\log x - 1)$

93. $\int x^m \log_a x\,dx = x^{m+1}\left\{\frac{\log_a x}{m+1} - \frac{\log_a e}{(m+1)^2}\right\}$

94. $\int x^m \log x\,dx = x^{m+1}\left\{\frac{\log x}{m+1} - \frac{1}{(m+1)^2}\right\}$

Exponential Integrals

95. $\int a^x dx = \frac{a^x}{\log a}$

96. $\int e^x dx = e^x$

97. $\int xe^x dx = e^x(x-1)$

98. $\int x^m e^x dx = x^m e^x - m\int x^{m-1}e^x dx$

Trigonometric Integrals

N. B. In these formulas m and n are *positive integers* unless otherwise indicated.

99. $\int \sin x\,dx = -\cos x$

100. $\int \sin^2 x\,dx = \frac{1}{2}(x - \sin x\cos x)$

101. $\int \sin^n x\,dx = \int (1-\cos^2 x)^{\frac{n-1}{2}} \sin x\,dx$ when n is *odd*

Then expand $(1-\cos^2 x)^{\frac{n-1}{2}}$ and use formula 112.

102. $\int \sin^n x\,dx = -\frac{\sin^{n-1} x \cos x}{n} + \frac{n-1}{n}\int \sin^{n-2} x\,dx$

when n is *even*

103. $\int \frac{dx}{\sin^n x} = -\frac{\cos x}{(n-1)\sin^{n-1} x} + \frac{n-2}{n-1}\int \frac{dx}{\sin^{n-2} x}$

when n is *odd*, $\neq 1$

104. $\int \frac{dx}{\sin^n x} = \int \csc^n x\,dx$ when n is *even*. Then use formula 131.

105. $\int \cos x\,dx = \sin x$

106. $\int \cos^2 x\,dx = \frac{1}{2}(x + \sin x \cos x)$

107. $\int \cos^n x\,dx = \int (1-\sin^2 x)^{\frac{n-1}{2}} \cos x\,dx$ when n is odd

Then expand $(1-\sin^2 x)^{\frac{n-1}{2}}$ and use formula 111.

108. $\int \cos^n x\,dx = \frac{\cos^{n-1} x \sin x}{n} + \frac{n-1}{n}\int \cos^{n-2} x\,dx$

when n is *even*

109. $\int \frac{dx}{\cos^n x} = \frac{\sin x}{(n-1)\cos^{n-1} x} + \frac{n-2}{n-1}\int \frac{dx}{\cos^{n-2} x}$

when n is *odd*, $\neq 1$

110. $\int \frac{dx}{\cos^n x} = \int \sec^n x\,dx$ when n is *even*. Then use formula 127.

111. $\int \sin^n x \cos x\,dx = \frac{\sin^{n+1} x}{n+1}$

112. $\int \cos^n x \sin x\,dx = -\frac{\cos^{n+1} x}{n+1}$

n is *any constant* $\neq -1$

113. $\int \sin^2 x \cos^2 x\, dx = \frac{4x - \sin 4x}{32}$

114. $\int \frac{dx}{\sin x \cos x} = \log \tan x$

$\int \sin^m x \cos^n x\, dx, \qquad \int \frac{\sin^m x\, dx}{\cos^n x}, \qquad \int \frac{\cos^n x\, dx}{\sin^m x},$

and $\int \frac{dx}{\sin^m x \cos^n x}$ may be reduced to integrals given above by the use of the following reduction formulas, in which r and s are any integers *positive* or *negative*.

115. $\int \sin^r x \cos^s x\, dx = \frac{\cos^{s-1} x \sin^{r+1} x}{r+s} + \frac{s-1}{r+s} \int \sin^r x \cos^{s-2} x\, dx$ when $r + s \neq 0$

116. $\int \sin^r x \cos^s x\, dx = -\frac{\sin^{r-1} x \cos^{s+1} x}{r+s} + \frac{r-1}{r+s} \int \sin^{r-2} x \cos^s x\, dx$ when $r + s \neq 0$

117. $\int \sin^r x \cos^s x\, dx = \frac{\sin^{r+1} x \cos^{s+1} x}{r+1} + \frac{s+r+2}{r+1} \int \sin^{r+2} x \cos^s x\, dx$ when $r \neq -1$

118. $\int \sin^r x \cos^s x\, dx = -\frac{\sin^{r+1} x \cos^{s+1} x}{s+1} + \frac{s+r+2}{s+1} \int \sin^r x \cos^{s+2} x\, dx$ when $s \neq -1$

119. $\int \tan x\, dx = -\log \cos x$

120. $\int \tan^n x\, dx = \frac{\tan^{n-1} x}{n-1} - \frac{\tan^{n-3} x}{n-3} + \frac{\tan^{n-5} x}{n-5} \cdots \mp \tan x \pm x$ when n is *even*

121. $\int \tan^n x\, dx = \int (\sec^2 x - 1)^{\frac{n-1}{2}} \tan x\, dx$ when n is *odd*

Then expand $(\sec^2 x - 1)^{\frac{n-1}{2}}$ and use formula 133.

122. $\int \cot x dx = \log \sin x$

123. $\int \cot^n x\,dx = -\frac{\cot^{n-1} x}{n-1} + \frac{\cot^{n-3} x}{n-3} - \frac{\cot^{n-5} x}{n-5} \cdots$

$\cdots \pm \cot x \mp x$ when n is *even*

124. $\int \cot^n x\,dx = \int (\csc^2 x - 1)^{\frac{n-1}{2}} \cot x\,dx$ when n is *odd*

Then expand $(\csc^2 x - 1)^{\frac{n-1}{2}}$ and use formula 134.

125. $\int \sec x\,dx = \log (\sec x + \tan x)$ 126. $\int \sec^2 x\,dx = \tan x$

127. $\int \sec^n x\,dx = \int (\tan^2 x + 1)^{\frac{n-2}{2}} \sec^2 x\,dx$ when n is *even*

Then expand $(\tan^2 x + 1)^{\frac{n-2}{2}}$ and use formula 135.

128. $\int \sec^n x\,dx = \int \frac{dx}{\cos^n x}$ when n is odd, and use formula 109.

129. $\int \csc x\,dx = \log (\csc x - \cot x)$

130. $\int \csc^2 x\,dx = -\cot x$

131. $\int \csc^n x\,dx = \int (\cot^2 x + 1)^{\frac{n-2}{2}} \csc^2 x\,dx$ when n is *even*

Then expand $(\cot^2 x + 1)^{\frac{n-2}{2}}$ and use formula 136.

132. $\int \csc^n x\,dx = \int \frac{dx}{\sin^n x}$ when n is *odd*, and use formula 103.

133. $\int \sec^n x \tan x \, dx = \frac{\sec^n x}{n}$

134. $\int \csc^n x \cot x \, dx = -\frac{\csc^n x}{n}$

where n is *any constant* $\neq 0$

135. $\int \tan^n x \sec^2 x \, dx = \frac{\tan^{n+1} x}{n+1}$

136. $\int \cot^n x \csc^2 x \, dx = -\frac{\cot^{n+1} x}{n+1}$

where n is *any constant* $\neq -1$

137. $\int \frac{dx}{a + b\cos x} = \frac{-1}{\sqrt{a^2 - b^2}} \sin^{-1} \frac{b + a\cos x}{a + b\cos x}$ when $a^2 > b^2$

138. $\int \frac{dx}{a + b\cos x} = \frac{1}{\sqrt{b^2 - a^2}} \log \frac{b + a\cos x + \sqrt{b^2 - a^2}\sin x}{a + b\cos x}$ when $b^2 > a^2$

139. $\int \frac{dx}{a + b\sin x} = \frac{1}{\sqrt{a^2 - b^2}} \sin^{-1} \frac{b + a\sin x}{a + b\sin x}$ when $a^2 > b^2$

140. $\int \frac{dx}{a + b\sin x} = \frac{-1}{\sqrt{b^2 - a^2}} \log \frac{b + a\sin x + \sqrt{b^2 - a^2}\cos x}{a + b\sin x}$ when $b^2 > a^2$

Every integral involving only the trigonometric functions of x, and those only rationally, can be changed to an integral of a rational algebraic fraction by the substitution

$$z = \tan \frac{x}{2}.$$

For, if

$$\tan \frac{x}{2} = z,$$

$$\tan x = \frac{2z}{1 - z^2}$$

$$\sin x = \frac{2z}{1 + z^2}$$

$$\cos x = \frac{1 - z^2}{1 + z^2}$$

$$dx = \frac{2dz}{1 + z^2}$$

141. $\int \sqrt{1 - \cos x} \, dx = -2\sqrt{2}\cos \frac{x}{2}$

142. $\int \sqrt{(1-\cos x)^3}\,dx = \frac{4\sqrt{2}}{3}\left(\cos^2\frac{x}{2} - 3\cos\frac{x}{2}\right)$

143. $\int x\sin x\,dx = \sin x - x\cos x$

144. $\int x^2\sin x\,dx = 2x\sin x + (2-x^2)\cos x$

145. $\int x\cos x\,dx = \cos x + x\sin x$

146. $\int x^2\cos x\,dx = 2x\cos x + (x^2-2)\sin x$

Inverse Trigonometric Integrals

147. $\int \sin^{-1} x\,dx = x\sin^{-1} x + \sqrt{1-x^2}$

148. $\int \cos^{-1} x\,dx = x\cos^{-1} x - \sqrt{1-x^2}$

149. $\int \tan^{-1} x\,dx = x\tan^{-1} x - \log\sqrt{1+x^2}$

150. $\int \cot^{-1} x\,dx = x\cot^{-1} x + \log\sqrt{1+x^2}$

151. $\int \sec^{-1} x\,dx = x\sec^{-1} x - \log\left(x+\sqrt{x^2-1}\right)$

$= x\sec^{-1} x - \cosh^{-1} x$

152. $\int \csc^{-1} x\,dx = x\csc^{-1} x + \log\left(x+\sqrt{x^2-1}\right)$

$= x\csc^{-1} x + \cosh^{-1} x$

Exponential-Trigonometric Integrals

153. $\int e^{ax}\sin x\,dx = \frac{e^{ax}(a\sin x - \cos x)}{a^2+1}$

154. $\int e^{ax}\cos x\,dx = \frac{e^{ax}(a\cos x + \sin x)}{a^2+1}$

Binomial Reduction Formulas

$$(A)\quad \int x^m (ax^n + b)^p\, dx = \frac{x^{m-n+1}(ax^n + b)^{p+1}}{a(m + np + 1)} - \frac{b(m - n + 1)}{a(m + np + 1)} \int x^{m-n}(ax^n + b)^p dx,$$

$$(B)\quad \int x^m (ax^n + b)^p\, dx = \frac{x^{m+1}(ax^n + b)^p}{m + np + 1} + \frac{bnp}{m + np + 1} \int x^m (ax^n + b)^{p-1} dx,$$

except when $m + np + 1 = 0$.

$$(C)\quad \int x^m (ax^n + b)^p\, dx = \frac{x^{m+1}(ax^n + b)^{p+1}}{b(m + 1)} - \frac{a(m + np + n + 1)}{b(m + 1)} \int x^{m+n}(ax^n + b)^p dx, \quad \text{except when } m + 1 = 0.$$

$$(D)\quad \int x^m (ax^n + b)^p\, dx = -\frac{x^{m+1}(ax^n + b)^{p+1}}{bn(p + 1)} + \frac{m + np + n + 1}{bn(p + 1)} \int x^m (ax^n + b)^{p+1} dx, \quad \text{except when } p + 1 = 0.$$

Definite Integrals

155. $$\int_0^1 x^{m-1}(1-x)^{n-1}dx = \int_0^\infty \frac{x^{m-1}dx}{(1+x)^{m+n}} = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$$

156. $$\int_0^\infty \frac{dx}{1+x^2} = \frac{\pi}{2}$$

157. $$\int_0^\infty \frac{dx}{1+x^3} = \frac{2\pi}{9}\sqrt{3}$$

158. $$\int_0^\infty \frac{dx}{1+x^4} = \frac{\pi}{4}\sqrt{2}$$

159. $$\int_0^\infty \frac{dx}{1+x^6} = \frac{\pi}{3}$$

160. $$\int_0^{\frac{\pi}{2}} \sin^{2n} x\, dx = \frac{1\cdot 3\cdot 5\cdot\cdots\cdot(2n-1)}{2\cdot 4\cdot 6\cdot\cdots\cdot 2n}\frac{\pi}{2}$$

161. $$\int_0^{\frac{\pi}{2}} \sin^{2n+1} x\, dx = \frac{2\cdot 4\cdot 6\cdot\cdots\cdot 2n}{1\cdot 3\cdot 5\cdot\cdots\cdot(2n+1)}$$

162. $$\int_0^{\frac{\pi}{2}} \sin^n x\, dx = \frac{\sqrt{\pi}}{2}\frac{\Gamma\left(\frac{n+1}{2}\right)}{\Gamma\left(\frac{n}{2}+1\right)} \quad [n > -1]$$

163. $$\int_0^\infty \frac{\sin x}{x}\, dx = \frac{\pi}{2}$$

164. $$\int_0^\infty \frac{\sin^2 x}{x^2}\, dx = \frac{\pi}{2}$$

165. $$\int_0^\infty \sin x^2\, dx = \frac{1}{2}\sqrt{\frac{\pi}{2}}$$

166. $$\int_0^\infty e^{-x^2}dx = \frac{1}{2}\sqrt{\pi}$$

167. $$\int_0^\infty x^n e^{-x}dx = \Gamma(n+1)$$

COMPLETE ELLIPTIC INTEGRALS, K AND E

$$K = \int_0^{\frac{\pi}{2}} \frac{dx}{\sqrt{1 - k^2 \sin^2 x}}, \qquad E = \int_0^{\frac{\pi}{2}} \sqrt{1 - k^2 \sin^2 x} \cdot dx$$

$\sin^{-1} k$	K	E	$\sin^{-1} k$	K	E
0°	1.5708	1.5708	50°	1.9356	1.3055
1	1.5709	1.5707	51	1.9539	1.2963
2	1.5713	1.5703	52	1.9729	1.2870
3	1.5719	1.5697	53	1.9927	1.2776
4	1.5727	1.5689	54	2.0133	1.2681
5	1.5738	1.5678	55	2.0347	1.2587
6	1.5751	1.5665	56	2.0571	1.2492
7	1.5767	1.5649	57	2.0804	1.2397
8	1.5785	1.5632	58	2.1047	1.2301
9	1.5805	1.5611	59	2.1300	1.2206
10	1.5828	1.5589	60	2.1565	1.2111
11	1.5854	1.5564	61	2.1842	1.2015
12	1.5882	1.5537	62	2.2132	1.1921
13	1.5913	1.5507	63	2.2435	1.1826
14	1.5946	1.5476	64	2.2754	1.1732
15	1.5981	1.5542	65	2.3088	1.1638
16	1.6020	1.5405	65.5	2.3261	1.1592
17	1.6061	1.5367	66.0	2.3439	1.1546
18	1.6105	1.5326	66.5	2.3622	1.1499
19	1.6151	1.5283	67.0	2.3809	1.1454
20	1.6200	1.5238	67.5	2.4001	1.1408
21	1.6252	1.5191	68.0	2.4198	1.1362
22	1.6307	1.5141	68.5	2.4401	1.1317
23	1.6365	1.5090	69.0	2.4610	1.1273
24	1.6426	1.5037	69.5	2.4825	1.1228
25	1.6490	1.4981	70.0	2.5046	1.1184
26	1.6557	1.4924	70.5	2.5273	1.1140
27	1.6627	1.4864	71.0	2.5507	1.1096
28	1.6701	1.4803	71.5	2.5749	1.1053
29	1.6777	1.4740	72.0	2.5998	1.1011
30	1.6858	1.4675	72.5	2.6256	1.0968
31	1.6941	1.4608	73.0	2.6521	1.0927
32	1.7028	1.4539	73.5	2.6796	1.0885
33	1.7119	1.4469	74.0	2.7081	1.0844
34	1.7214	1.4397	74.5	2.7375	1.0804
35	1.7312	1.4323	75.0	2.7681	1.0764
36	1.7415	1.4248	75.5	2.7998	1.0725
37	1.7522	1.4171	76.0	2.8327	1.0686
38	1.7633	1.4092	76.5	2.8669	1.0648
39	1.7748	1.4013	77.0	2.9026	1.0611
40	1.7868	1.3931	77.5	2.9397	1.0574
41	1.7992	1.3849	78.0	2.9786	1.0538
42	1.8122	1.3765	78.5	3.0192	1.0502
43	1.8256	1.3680	79.0	3.0617	1.0468
44	1.8396	1.3594	79.5	3.1064	1.0434
45	1.8541	1.3506	80.0	3.1534	1.0401
46	1.8691	1.3418	80.2	3.1729	1.0388
47	1.8848	1.3329	80.4	3.1928	1.0375
48	1.9011	1.3238	80.6	3.2132	1.0363
49	1.9180	1.3147	80.8	3.2340	1.0350

$\sin^{-1} k$	K	E	$\sin^{-1} k$	K	E
81.0°	3.2553	1.0338	86.0°	4.0528	1.0087
81.2	3.2771	1.0326	86.2	4.1037	1.0079
81.4	3.2995	1.0313	86.4	4.1574	1.0072
81.6	3.3223	1.0302	86.6	4.2142	1.0065
81.8	3.3458	1.0290	86.8	4.2744	1.0059
82.0	3.3699	1.0278	87.0	4.3387	1.0053
82.2	3.3946	1.0267	87.2	4.4073	1.0047
82.4	3.4199	1.0256	87.4	4.4812	1.0041
82.6	3.4460	1.0245	87.6	4.5619	1.0036
82.8	3.4728	1.0234	87.8	4.6477	1.0031
83.0	3.5004	1.0223	88.0	4.7427	1.0026
83.2	3.5288	1.0213	88.2	4.8479	1.0022
83.4	3.5581	1.0202	88.4	4.9654	1.0017
83.6	3.5884	1.0192	88.6	5.0988	1.0014
83.8	3.6196	1.0182	88.8	5.2527	1.0010
84.0	3.6519	1.0172	89.0	5.4349	1.0008
84.2	3.6853	1.0163	89.1	5.5402	1.0006
84.4	3.7198	1.0153	89.2	5.6579	1.0005
84.6	3.7557	1.0144	89.3	5.7914	1.0005
84.8	3.7930	1.0135	89.4	5.9455	1.0003
85.0	3.8317	1.0127	89.5	6.1278	1.0002
85.2	3.8721	1.0118	89.6	6.3504	1.0001
85.4	3.9142	1.0110	89.7	6.6385	1.0001
85.6	3.9583	1.0102	89.8	7.0440	1.0000
85.8	4.0044	1.0094	89.9	7.7371	1.0000

PARTIAL FRACTIONS

Every rational fraction in one variable with real coefficients can be written as the sum of a number of terms satisfying the following conditions:

Aside from a polynomial, every term must be a "desirable" fraction; that is, one whose denominator is either a prime (of first or second degree), or a power of such a prime, and whose numerator is of lower degree than *the prime in* its denominator. All such fractions can be integrated by means of Formulas 6, 7, 26, 27, 28, 29, and 30.

The separation of a given fraction into terms of the type described is performed as follows:

1. If the original numerator is not of lower degree than the denominator, divide until a remainder—*i. e.*, a new numerator—of lower degree is obtained; the new fraction is then to be separated into desirable fractions.

2. Find the prime factors (which, by the fundamental theorem of algebra, will be of first or second degree) of the denominator.

3. Write a fraction with denominator equal to *each* desirable denominator which is a factor of the original denominator.

4. As numerator of each desirable denominator, write the most general corresponding desirable numerator, with undetermined coefficients. If the denominator is a power of a quadratic prime $(ax^2 + bx + c)$, the best form for the numerator is $A(2ax + b) + B$.

5. Set the fraction obtained in 1 equal to the sum of those now obtained.

6. Multiply both members of the equation by the original denominator.

7. Equate coefficients of like powers of the two members of the equation now obtained, or substitute convenient values of the variable, to secure as many equations as there are unknown coefficients.

8. Solve the resulting equations for the unknown coefficients in the numerators.

Suppose, for an example, that $\int \frac{x^4 + 1}{(x^3 + 1)(x + 1)}\, dx$ is to be found

1. $\dfrac{x^4+1}{(x^3+1)(x+1)} = 1 + \dfrac{-x^3-x}{(x^3+1)(x+1)}$

2. $(x^3+1)(x+1) = (x+1)^2(x^2-x+1)$

3, 4, 5. $\dfrac{-x^3-x}{(x^3+1)(x+1)} = \dfrac{A}{x+1} + \dfrac{B}{(x+1)^2} + \dfrac{C(2x-1)+D}{x^2-x+1}$

6. $-x^3-x = A(x+1)(x^2-x+1) + B(x^2-x+1) + C(2x-1)(x+1)^2 + D(x+1)^2$
$= (A+2C)x^3 + (B+3C+D)x^2 + (-B+2D)x + (A+B-C+D)$

7.

Coefficients of x^3:	$-1 =$	A		$+2C$
Coefficients of x^2:	$0 =$	B	$+3C$	$+D$
Coefficients of x:	$-1 =$	$-B$		$+2D$
Substitution, $x = -1$:	$2 =$	$3B$		

8. $A = -\frac{2}{3}$
$B = +\frac{2}{3}$
$C = -\frac{1}{6}$
$D = -\frac{1}{6}$

Therefore $\dfrac{x^4+1}{(x^3+1)(x+1)} = 1 - \dfrac{\frac{2}{3}}{x+1} + \dfrac{\frac{2}{3}}{(x+1)^2} - \dfrac{\frac{1}{6}(2x-1)}{x^2-x+1} - \dfrac{\frac{1}{6}}{x^2-x+1}$

Each of the "desirable" fractions on the right can now be readily integrated.

TABLE XIV.—MATHEMATICAL CONSTANTS

e =	2.7182818
$\log_{10} e$ =	.434294
$\log_{10} \log_{10} e$ =	9.637784 − 10
$\log_e 10$ =	2.302585
π =	3.14159265
$\frac{1}{\pi}$ =	.31830989
π^2 =	9.8696044
π^3 =	31.0062767
π^4 =	97.409091
π^5 =	306.01968
π^6 =	961.38919
π^7 =	3020.2932
π^8 =	9488.5310
$\sqrt{\pi}$ =	1.7724539
$\log_{10} \pi$ =	.4971498727
$\log_e \pi$ =	1.1447298858

Euler's constant:

$$C = \lim_{n \to \infty} \left[\frac{1}{1} + \frac{1}{2} + \ldots + \frac{1}{n} - \log n \right]$$
$$= 1 - \log \tfrac{2}{1} + \tfrac{1}{2} - \log \tfrac{3}{2} + \tfrac{1}{3} - \log \tfrac{4}{3} + \ldots$$
$$= .5772157$$

Bernoulli's numbers:

$$B_1 = \tfrac{1}{6}, \quad B_3 = \tfrac{1}{30}, \quad B_5 = \tfrac{1}{42}, \quad B_7 = \tfrac{1}{30}$$
$$B_9 = \tfrac{5}{66}, \quad B_{11} = \tfrac{691}{2730}, \quad B_{13} = \tfrac{7}{6}, \ldots$$
$$\frac{x}{e^x - 1} = 1 - \frac{x}{2} + \frac{B_1 x^2}{2!} - \frac{B_3 x^4}{4!} + \frac{B_5 x^6}{6!} \ldots$$

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